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**INDIVIDUAL ENTREPRENEURIAL  
ORIENTATION AND BUSINESS EDUCATION  
DEVELOPMENT**

**Doctoral Thesis**

Scientific supervisor

Professor Dr.oec.

**INGA LAPIŅA**

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# ANOTĀCIJA

Pēdējās desmitgadēs rosinās diskusijas par mazo un vidējo uzņēmumu (MVU) vadītāju lomu, jo visā pasaulē ir novērojams mazo uzņēmumu skaita būtisks pieaugums. Daudziem maziem uzņēmumiem ar tiem raksturīgu lēzenu organizatorisko struktūru ir nepieciešams līderis, kurš vienlaikus būtu kā administrators, īpašnieks un uzņēmējs. Tajā pašā laikā dinamiskā ārējā vide uzņēmumiem rada tehnoloģiskos, ekonomiskos, politiskos un sociālos izaicinājumus. Korporatīvā sociālā atbildība, sociālie plašsaziņas līdzekļi, caurskatāmības evolūcija, ētiskā un ilgtspējīga domāšana ir vēl papildināmo aktualitāšu saraksts jaunajiem līderiem.

Augstākās izglītības iestādes (AII) attīsta studentu zināšanas un kompetences, veicinot viņu potenciālo un ilgtspējīgu nodarbinātību. AII, kas sniedz biznesa izglītību, ir pārmaiņu objekts, jo mūsdienu sabiedrībā pārskatot vadīšanas nozīmi, mainās priekšstats par vadītāju kompetencēm. Promocijas darbā ir izcelta problēma – vai kompetences, kas tiek attīstītas biznesa izglītības iestādēs, atbilst tirgus iesaistīto pušu, darba tirgus un studentu vajadzībām un interesēm. Promocijas darbā veiktā pētījuma mērķis ir padziļināti izpētīt biznesa izglītības attīstības tendences, noteikt aktuālās kompetences vadītājiem un uzņēmējiem un Individuālās uzņēmējdarbības orientācijas nozīme, noskaidrot mījsakarību starp elementiem, kas iesaistīti biznesa izglītības pilnveidē AII un izstrādāt metodoloģiju biznesa izglītības ieviešanas novērtēšanai.

Lai sasniegtu promocijas darbā izvirzīto mērķi, ir apskatīta biznesa izglītības attīstība, ņemot vērā aktualitātes šajā jomā, kā arī sistematizētas tendences un kompetences. Lai novērtētu studentu uzņēmējdarbības orientācijas līmeni, ir izstrādāts individuālās uzņēmējdarbības orientācijas indekss (IEO indekss), kas ietver tādas komponentes kā radošums, riska uzņemšanās un proaktivitāte. Izpētot lēmumu pieņemšanas rīkus un metodes kā starpnozaru labās prakses piemērus, ir izstrādāts augstskolas būtisko elementu uzlabošanas modelis, lai izvērtētu un uzraudzītu biznesa izglītības iestāžu situāciju. Ir izstrādāta un aprobēta metodoloģija, kas palīdz novērtēt, vai biznesa izglītības iestādes darbības rezultāti atbilst ieinteresēto pušu prasībām. Tas sniedz gan teorētisko pamatojumu, gan praktisko instrumentu biznesa izglītības pakalpojumu izvērtēšanai.

Promocijas darbs rakstīts angļu valodā. Promocijas darbs ietver ievadu, trīs daļas, secinājumus un priekšlikumus, izmantoto 284 avotu bibliogrāfisko sarakstu. Darbā ir 57 tabulas un 52 attēli. Darba apjoms ir 152 lapas, neieskaitot 51 pielikumu.

## ABSTRACT

During the recent decades the discussion about the roles of leaders of small and medium enterprises (SMEs) have been actively evolving – the debate is the result of a significant increase in the number of small companies over the globe. Many smaller organizations characterized by flatter organizational structures require their leader to act simultaneously as managers, owners, and entrepreneurs. At the same time, the dynamic external environment powers businesses with technological, economic, political, and social challenges. Corporate social responsibility, social media, the evolution of transparency, and ethical and sustainable thinking form the list of the calls for action for the new leaders, which is still incomplete.

Higher Education Institutions (hereafter referred to as HEIs) develop students' knowledge, skills and competences, contributing to their immediate and sustainable employability. In the case of HEIs, business education is a subject for change as the perception of managers' competences has changed a lot due to rethinking a managerial role in a modern society. The thesis addresses the problem whether the competences which are trained in business education HEIs match the needs and interests of the stakeholders, labour market, and students. The goal of the Thesis is to research business education development trends, identify contemporary competences for managers and research Individual Entrepreneurial Orientation importance in order to develop the methodology, elucidate the interrelation between the elements involved in business education improvement in HEIs, and elaborate on the methodology for the assessment of business education implementation.

To achieve this goal, the business education improvement was reconsidered given the latest changes and modern trends in the field; the trends and competences have been systematized. Individual Entrepreneurial Orientation Index (IEO Index) was developed based on Innovativeness and Creativity, Risk-taking, and Proactiveness components in order to evaluate the students' entrepreneurial competence level. Having explored the decision-making tools and methods as a cross-industry benchmark, a model including the key elements involved in business education improvement in HEIs has been designed to evaluate and monitor the states of the HEI. A methodology for assessing whether the HEI's performance meets its stakeholders' requirements has been proposed and tested, which serves as a sound theoretical basis and a practical tool to assess the business educational services.

The Doctoral Thesis has been written in English. It comprises an introduction, three chapters, conclusions, recommendations, and a list of references of 284 sources. It has been illustrated with 57 tables and 52 figures. The volume of the Thesis is 152 pages, excluding 51 annexes.

# TABLE OF CONTENTS

INTRODUCTION.....	7
1. BUSINESS EDUCATION AND TRENDS IN HIGHER EDUCATION DEVELOPMENT .....	21
1.1 Business Education Development.....	21
1.2 Business Education Environment and Stakeholders .....	26
1.3 Trends in Business Education Implementation.....	37
1.3.1 Partnership and Network.....	39
1.3.2 Curricula Development.....	40
1.3.3 Contemporary Teaching Methods.....	41
1.3.4 Entrepreneurship as a Transversal Competence .....	45
1.4 Contemporary Competences for Managers and Entrepreneurs.....	48
2 ENTREPRENEURIAL ORIENTATION AND COMPETENCE DEVELOPMENT	64
2.1 Entrepreneurial competences and managerial competences .....	64
2.1.1 Competences Research Theoretical Background.....	65
2.1.2 Competences Research Methodology .....	67
2.1.3 Competences Research Results.....	69
2.2 Individual Entrepreneurial Orientation (IEO).....	78
2.2.1 IEO Theory .....	78
2.2.2 IEO Research Methodology.....	83
2.2.3 IEO Research Results .....	86
3 ENHANCEMENT OF BUSINESS EDUCATION IMPLEMENTATION BASED ON STAKEHOLDER REQUIREMENTS .....	98
3.1 Agile Tools for System Evaluation and Lean Management .....	98
3.2 Essence Approach Adoption for HEI.....	103
3.3 Elaboration of Methodology for Assessment of Business Education Implementation.....	118
3.4 Validation of the Methodology for Assessment of Business Education Implementation.....	123
CONCLUSIONS AND RECOMMENDATIONS.....	130
LIST OF REFERENCES .....	133
APPENDIXES .....	153

## INTRODUCTION

The concepts of competences and capabilities have become more significant within the last decade, as the labor market demands graduates who would respond to agile changes and should be trained not only in educational subjects but also to have the knowledge, relevant skills and competences for proactive entrepreneurial actions within and outside the organization. Routine tasks are being constantly replaced by technology. Therefore, it is expected that HEIs (Higher Education Institutions) can train competences which contribute to students' prompt and sustainable employability and assist them in long-life learning. Business schools as a case of HEIs are considered a subject for significant change, as the perception of managers' competences has changed a lot due to rethinking a managerial role in modern society. Although there is no common opinion among researchers on a specific set of competences which should be developed to manage modern organizations, according to the Future of Jobs Report developed by the Organization for Economic Cooperation and Development (hereafter referred to as OECD) for the World Economic Forum in 2016, due to the extensive development of artificial intelligence, machine learning, and advanced robotics, some professions will disappear or will be transformed in the era of the fourth industrial revolution. Hence, the future workforce needs to adjust their skill set to maintain employability and gain benefits from the changes in the industry. Managerial professional competences are directly related to the external environment and are traditionally considered as a set of knowledge and abilities of an individual applied in practice. Oxford English Dictionary describes a manager as a "person responsible for controlling or administering an organization or group of staff". At the same time, researchers recently uncovered that the professional competences of managers are overlapping with competences and skills that are attributed to entrepreneurs; policymakers report on the demand for entrepreneurial behavior of employees assuming such actions as a key driver for sustainable employability during constant changes (OECD, 2018).

There is still no unanimous opinion about the duplication of managerial and entrepreneurial competencies in the scientific literature. During the recent decades, a discussion about the roles performed by the ones who lead small and medium enterprises (SMEs) has been actively evolving – the debate is a result of a significant increase in the number of small firms over the globe. Many smaller organizations characterized by flatter organizational structures require their leader to act simultaneously as managers, owners, and entrepreneurs. SMEs, in general, have a shorter lifecycle than corporate organizations, but moving forward from the earliest life cycle stage to their later stages, small business organizations require their leader to have different sets of skills and competencies. At the same time, the dynamic external environment powers businesses with technological, economic, political, and social challenges. Corporate social responsibility, social media, the evolution of transparency, and ethical and sustainable thinking form the list of the calls for action for the new leaders, which is still incomplete.

However, the policymakers and academia are convinced that the modern form of business leadership is based on entrepreneurship, which is a key to economic growth, innovation, and employability. Hence, educational activities focused on developing entrepreneurial competence, spotting, and exploiting business opportunities, or legal literacy for young

entrepreneurs are incorporated into educational programs worldwide. Entrepreneurship is understood as a transversal competence which is expected to be integrated into multiple disciplines and trained by a cross-disciplinary approach which is a combination of digital and financial literacy, business plan development, and marketing campaign in new media, business simulations, and statistics tools for data processing.

The abovementioned preconditions have determined the topicality of the theme. The author of the Doctoral Thesis investigates whether the competences developed in business education match the needs and interests of the market stakeholders, entrepreneurs, and students. Therefore, the research is devoted to discovering whether the output of the HEIs educational services is aligned with the market needs or competence development and training require more agility to meet the stakeholders' expectations to make customers of the service more satisfied with its output. Having conducted the analysis of secondary sources, it was discovered that individual entrepreneurial orientation (IEO) and its components as well as attitude, learning, and behavior are considered as a challenge and provide opportunities to advance business education. From this perspective individual entrepreneurial orientation is a construct uniting attitude of the individuals (students) with the labor market needs through the individual motivation, personal traits, and competences which are developed and enforced by HEIs.

Considering agility as one of the key characteristics of the modern organizational management, the author investigated whether it is possible to transfer agile software development practices and use them as a benchmark to track the status of educational endeavors and provide HEIs with a tool for decision-making to plan the next actions. Individual entrepreneurial orientation index is required to evaluate business education development status, assess impact of changes in stakeholders' requirements, and quality of the educational service. Following this, a solution should be proposed for HEIs which contributes to the business education development, thus, evaluating the status of an educational system. Currently, there is considered to be a lack of method aiming to develop a coherent view of the multiple elements of the system which forms an integrated model for decision-making and might be measured with performance indicators. Hereafter, the study aims to bridge the research gap in management theory by applying an agile approach for assessing the output of a business education institution considering the changing stakeholders' requirements. Subsequently, this leads us to assumption that the study would bring the following scientific contribution to the management theory:

- 1) elements of individual entrepreneurial orientation concept are incorporated into the adopted agile approach;

- 2) the adopted agile approach is integrated with the stakeholder theory elements.

The present Doctoral Thesis provides a solution on how to evaluate promptly and implement a strategy to develop competence in asset management required for sustainable organizational growth. In addition, the paper provides the analysis on the comparison of competences required for managers and entrepreneurs in a modern rapidly changing environment as well as reflects future labor force attitude towards a setup and governance of a business enterprise.

### **Research questions**

1. What competence needs to be developed by business education to meet the requirements of their stakeholders?
2. What are the elements of individual entrepreneurial orientation and its importance for contemporary competence development for managers by business education?
3. What elements are essential to develop a systemic view and provide HEI with a decision-making tool to improve business education?

### **The goal of the research**

To evaluate business education development trends, identify contemporary competences for managers and research importance of individual entrepreneurial orientation, and elucidate the interrelation between the elements involved in business education improvement in HEIs in order to elaborate on a methodology for the assessment of business education implementation.

In order to reach the goal, the following **enabling objectives** have been formulated:

1. To explore the background of business education, its environment, and stakeholders in order to define its constituents and factors influencing business education.
2. To investigate changes in business education implementation caused by the external and internal factors influencing business education.
3. To analyze the theoretical literature, compare managerial and entrepreneurial competences, and determine their components to be developed in the future leaders who are in charge of a modern organizational management.
4. To survey the stakeholders' opinions to explore the requirements of the external and internal stakeholders towards the output of business education in terms of competence.
5. To explore entrepreneurship and entrepreneurial orientation theories in order to identify the most important elements to measure the business education students' individual entrepreneurial orientation (IEO).
6. To compare the IEO Index values in order to explore the level of the IEO index of students' groups in different European HEIs.
7. To study the theoretical and practical aspects of different agile tools for system evaluation and decision making in order to develop a methodology for continuous improvement of HEI's performance.
8. To conduct interviews with HEIs experts in order to approbate and validate the proposed methodology and draw the relevant conclusions.

The **research object**: Business education, its main stakeholders, and the actual competences.

The **research subject**: Business education implementation in HEIs and modern approaches to assess the interrelations between the results of business education and the requirements of the stakeholders involved.

### **Limitations of the research**

1. In this study, the author explored the interrelations of HEI and IEO. Apart from HEIs, there is a range of other factors such as social context, family context, personal traits, and experience that could impact the evolvement of IEO and its components. Each factor might be considered as a field for extensive independent research.
2. The impact of the content of business education programs carried out by HEIs has not been studied in depth, since the doctoral study focuses on the systemic development of HEIs' activities, which also includes the development of programs.
3. The author did not analyze the impact of the Covid-19 pandemic, lockdowns, and remote education on entrepreneurial competence development and its interplay with IEO components.

### **Theoretical and methodological framework of the research**

The study is based on the theories and approaches elaborated by the leading scholars in the fields of university and business cooperation and stakeholders' management: J. H. Block, V. Galan-Muros, R. E. Freeman, C. Plewa, B. Rivža, A. Straujuma, T. Pavlova, and S. G. Walter. Moreover, the studies on competence development in the changing environment and the increasing role of entrepreneurship as a transversal competence, conducted by such remarkable researchers as B. B. Dunford, M. Frese, I. Lapiņa, L. Manning, K. Oganisjana, S. A. Snell, and P. M. Wright were used.

IEO theories and research conducted by notable scientists, D. L. Bolton, C. Boulton, J. G. Covin, M. C. Howard, W. L. Koe, T. Kollmann, N. M. Levenburg, D. Miller, J. Parnell, and G. Santos were used as a foundation for IEO index construction. The findings of D. H. Peters, M. Pidd, R. Smith, and M. L. Tushman in decision-making in the operations management field were used for holistic model development. Essence framework for holistic system assessment developed by I. Jacobson was applied as a benchmark for elaboration of the Agile methodology for the assessment of business education implementation.

### **Source of information**

Various sources of information were used to obtain a large amount of data:

- the web-based database of the European statistics *Eurostat*;
- European commercial social networking site for academic researchers *ResearchGate*;
- academic research databases *Scopus*, *Web of Science*, *ScienceDirect*, *EBSCO*;
- SEAS Project, Survey on Entrepreneurship Attitude of Students conducted by the Faculty of Management and Economics of Gdansk University of Technology and Faculty of Engineering Economics and Management of Riga Technical University (No. 22000-3.2/5);
- ERASMUS+ program of the European Union within Strategic partnerships for higher education “European Entrepreneurship Training Community: Augmenting academic entrepreneurial training methodology, international

students' entrepreneurship community, and fundamental entrepreneurial university network" (No. 2018-1-LV01-KA203-046974).

### The research design

The research design was developed to answer the research questions by applying qualitative and quantitative research methods. The research questions, the goal of the research, and the research objectives prescribe the logics of the research design and is presented on Fig.1.

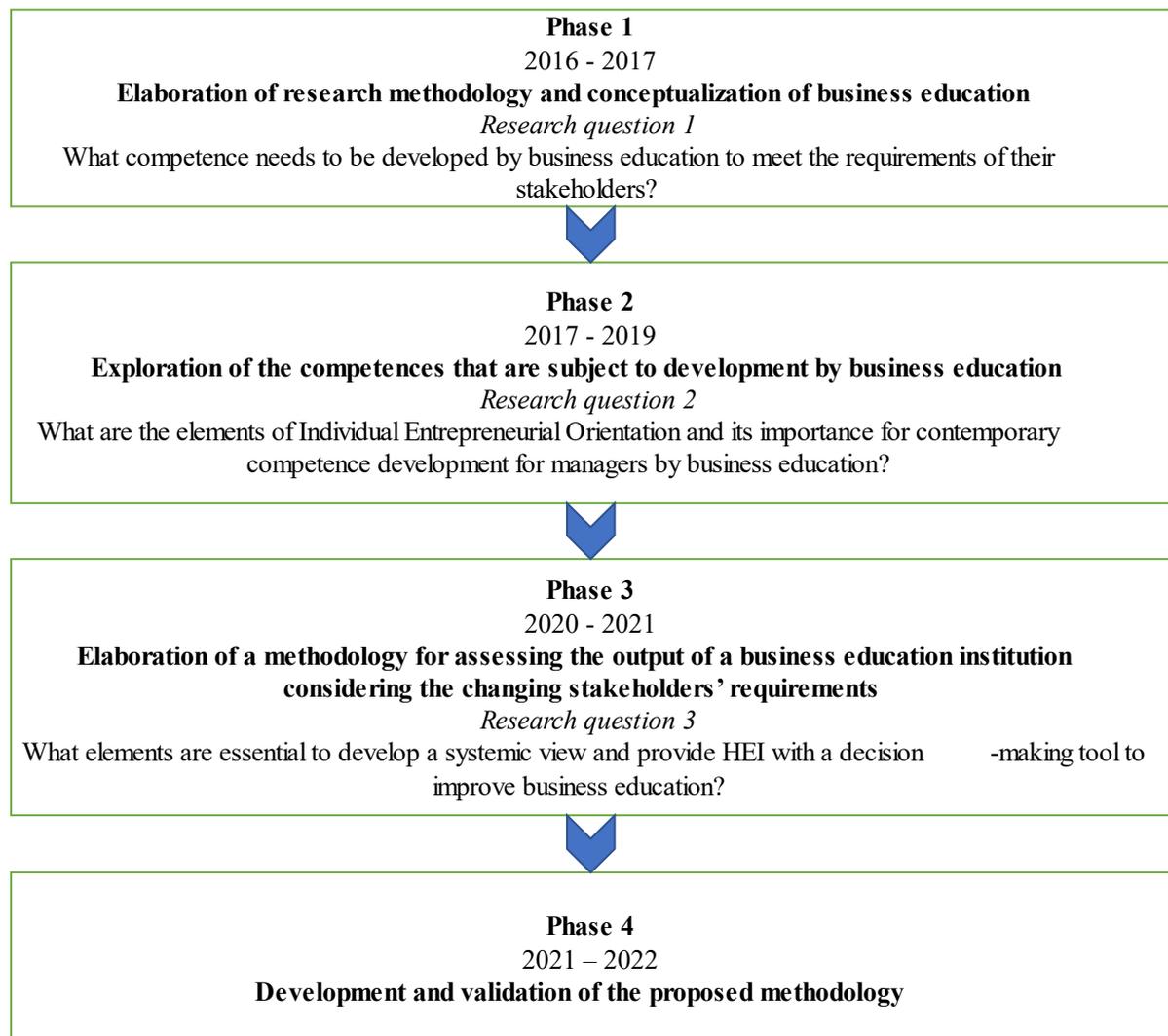


Fig. 1. Research phases.

#### ***Phase 1. Elaboration of research methodology and conceptualization of business education***

The research phase includes the following steps:

- the analysis of secondary sources in order to form a sound theoretical scientific framework, identify the research problem, and define the research questions;

- the elaboration of research methodology, identification of the goal and objectives of the research, its object, and subject, development of the research design and research methods.

Research Question 1 “What competence needs to be developed by business education to meet the requirements of their stakeholders?” was answered in accordance with the analysis of the scientific literature, which led to the conceptualization of understanding for the following principles:

- defining business education and its institutions;
- stakeholders’ perspective in business education;
- modern trends in business education;
- competences that are required for managers to lead modern organizations.

Conceptual model of Phase 1 of the research and its contextual overlapping with Phase 2 is presented in Fig. 2.

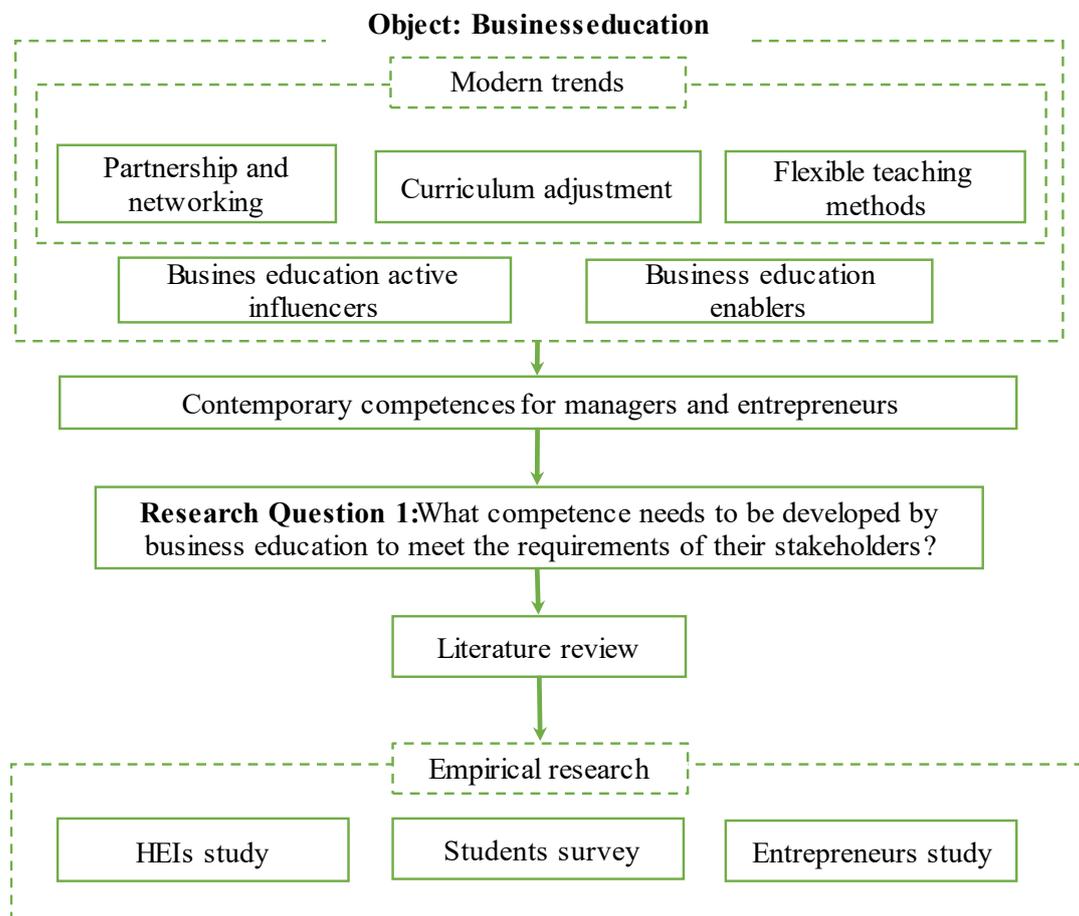


Fig. 2. Conceptual model of Phase 1 of the research.

*Phase 2. Exploration of competences that are subject to development by business education*

The main focus of the phase was to define the competences to be developed by business education institutions. The exploration of Research Question 2 “What are the elements of individual entrepreneurial orientation and its importance for contemporary competence development for managers by business education?” put forward the following principles:

- entrepreneurial competence is a desirable outcome developed by HEI;
- individual entrepreneurial orientation could be assumed as a complex indicator to measure entrepreneurial competence.

The conceptual model of this part of the research is presented in Fig. 3.

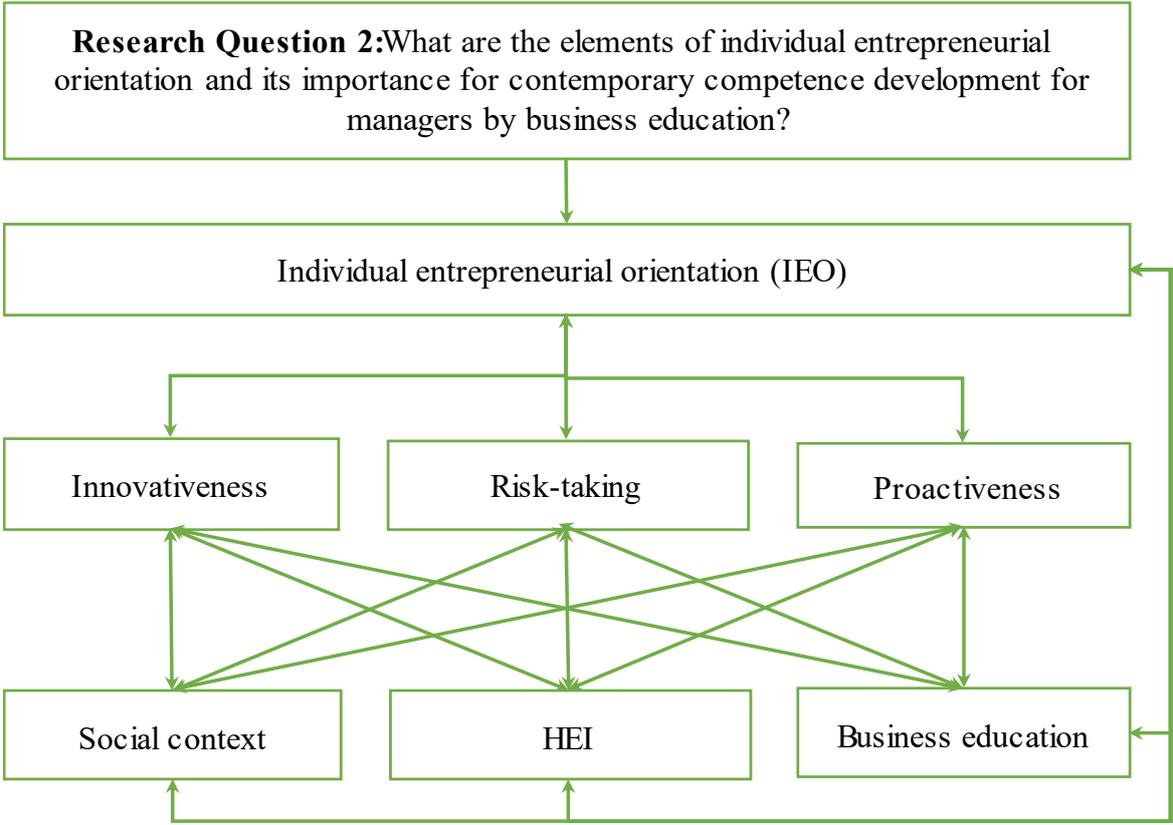


Fig. 3. Conceptual model of Phase 2 of the study.

**Phase 3. Elaboration of a methodology for assessing the output of a business education institution considering the changing stakeholders’ requirements**

The purpose of Phase 3 is to explore decision-making practices and cross-industry benchmarks for agile and holistic system evaluation and lean management. The phase is a cornerstone to address Research Question 3 “What elements are essential to develop a systemic view and provide HEI with a decision-making tool to improve business education?” Hereafter, a methodology for assessing the output of a business education institution considering the changing stakeholders’ requirements was created.

The conceptual model of this part of the research is presented in Fig. 4).

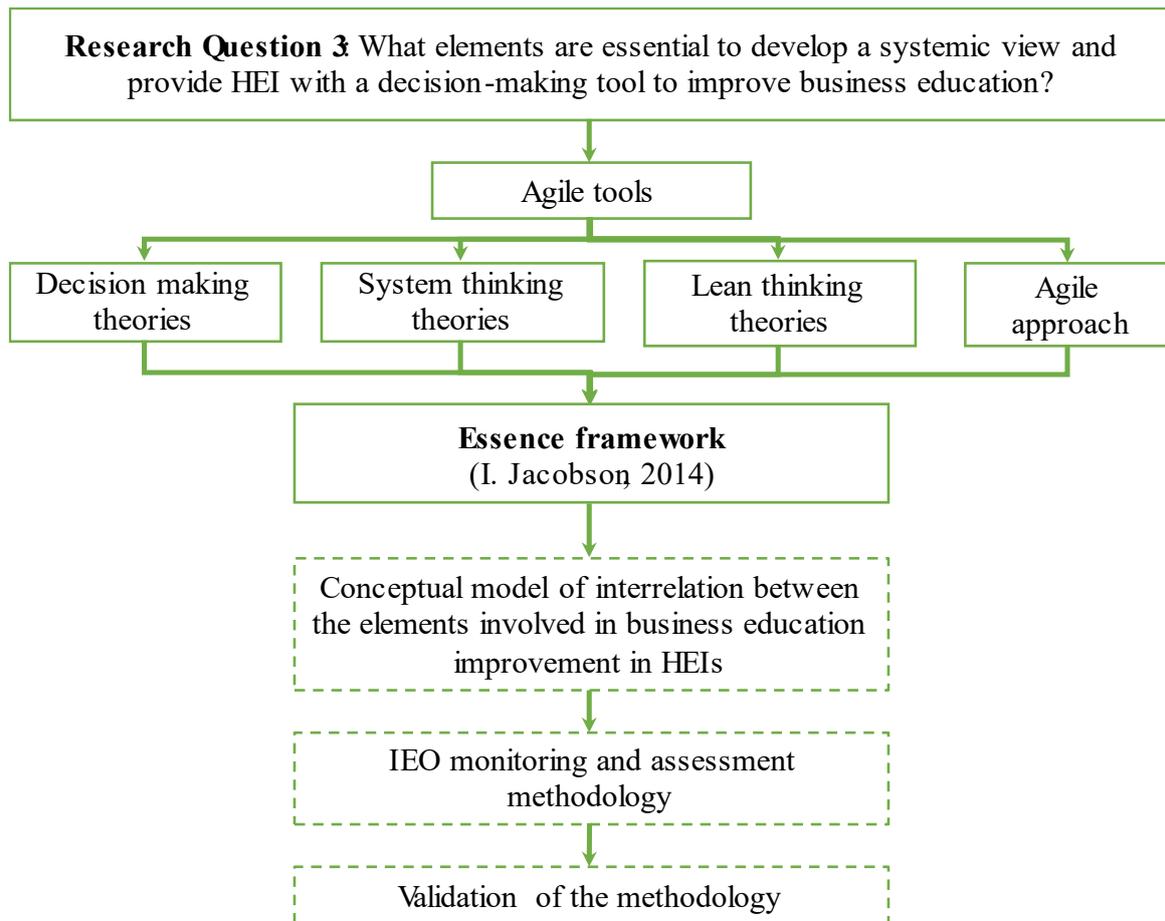


Fig. 4. Conceptual model of Phase 3 of the research (developed by author).

#### ***Phase 4. Development and testing of the proposed methodology***

The aim of Phase 4 is to investigate answers to Research Question 3 in the context of its practical implication. The research concludes with the evolution and testing of the proposed methodology for assessing the output of a business education institution considering the changing stakeholders' requirements. The methodology considers the interests of major stakeholders and presents a set of tools developed to assess a business education institution's status and the quality of its educational service's output. The methodology was tested in RTU Faculty of Engineering Economics and Management and Riga Business School (Latvia), EKA University of Applied Science (Latvia), Banku Augstskola (Latvia), Gdansk University of Technology (Poland), and Poznan Technological University (Poland).

#### **Research methods**

The research methods include both qualitative and quantitative research practices.

Data collection tools comprised:

- surveys (including online surveys);
- focus groups;
- semi-structured interviews.

Qualitative data analysis methods:

- systematic literature review;
- qualitative content analysis of the texts of scientific articles;
- data triangulation.

Quantitative data analysis methods:

- cluster analysis was applied to the coded qualitative data to clarify the relationship among competences groups;
- importance performance analysis was conducted to identify the competences that are less developed and more developed by HEIs and business supporting institutions (further in the text – BSIs);
- descriptive statistics analysis;
- inferential statistics methods include correlation analysis, non-parametric inductive analysis, and logistic regression analysis.

### **Scientific novelty**

1. Competences developed by business education required and expected by the labour market have been identified. It was disclosed that the core competences, including creativity and innovativeness, risk-taking, and proactiveness, are relevant for managers and entrepreneurs.
2. According to the needs of HEIs' stakeholders in three European countries, a level of entrepreneurial competences' importance has been explored, and HEIs' performance in terms of the entrepreneurial competence training has been evaluated. The different stakeholders' groups stressed the significance of competence for employability.
3. Individual entrepreneurial orientation (IEO) index has been developed as a composite indicator based on the pillars of innovativeness and creativity, risk-taking, and proactiveness. The IEO index can measure the students' entrepreneurial competence development level.
4. The IEO research was conducted in five HEIs in different countries to measure the entrepreneurial competence level of the students. The different IEO level is a subject of HEI impact on the formation and development of entrepreneurial competence.
5. A conceptual model that characterizes the interrelationships of the elements involved in the improvement of business education and forms a holistic and systemic view of the business education offered by HEIs has been created in order to assess and monitor the state of the elements developing the system. The model encompasses the HEIs' stakeholders, their requirements, external environment, as well as internal environment and processes.
6. The methodology for assessment of business education implementation following HEI stakeholders' requirements has been constructed. It helps the administration to take decisions on a systemic basis which could increase the competitiveness of the

higher education institution and ensure business education that meets the requirements of the labor market.

### **Practical application of the research**

The created checklists and questionnaires supported materials for the developed methodology for assessing the business education versus their stakeholders' requirements providing the HEI academic staff with a handy tool for the organization's assessment and decision-making.

### **Hypothesis**

The methodology for assessing the output of business education versus their stakeholders' requirements and monitoring of individual entrepreneurial orientation of the HEI's students is essential in establishing and implementing a continuous improvement approach in the organization and introducing a decision-making tool to increase the organization's agility.

### **Theses for defense**

By summarizing theoretical conclusions and the results of the empirical study obtained in the course of developing the Doctoral Thesis, the following theses are put forward for the defense:

Business education is a subject of significant transformation within the last decades due to the increasing role of HEIs' stakeholders and their requirements for competences developed by business education.

Although the managerial and entrepreneurial competences are partially overlapping, the core competences for managers and entrepreneurs are not different and are related to creativity and innovativeness, risk-taking, and proactivity.

Entrepreneurial competence of the business education students can be measured through individual entrepreneurial orientation, which is based on creativity and innovativeness, risk-taking, and proactiveness.

The methodology for assessing the output of business education in accordance with their stakeholders' requirements can be applied in HEI to introduce an approach for continuous improvement, develop a systemic view, and provide the academic staff with a decision-making tool to increase the organization's agility.

### **Approbation and practical application of research results**

The research results were presented and discussed at international scientific conferences in Italy, Latvia, Lithuania, and Poland and were further reflected in the corresponding scientific publications.

The research results and methodology developed to assess whether the output of business education meets the stakeholders' requirements were validated from April to June 2022 by six HEIs: RTU Riga Business School (Latvia), EKA University of Applied Science (Latvia), Gdansk University of Technology (Poland), BA School of Business and Finance (Latvia),

Poznan Technological University (Poland), and Faculty of Engineering Economics and Management of Riga Technical University (Latvia).

The research results are applied in the international research SEAS project (Survey on Entrepreneurship Attitude of Students), which has been an ongoing project at the Faculty of Management and Economics, Gdansk University of Technology (Poland) and Faculty of Engineering Economics and Management, Riga Technical University (Latvia).

### **Scientific publications**

The results of the research were reflected in 8 published articles, 6 are indexed in SCOPUS and Web of Science.

Nikitina, T., Licznarska, M., Ozoliņa-Ozola, I. and Lapiņa, I. Individual entrepreneurial orientation: comparison of business and STEM students. *Education + Training*, 2022, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/ET-07-2021-0256>

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3. Nikitina, T., Ozoliņa-Ozola, I., and Lapiņa, I. Higher Education and Individual Entrepreneurial Orientation: Empirical Evidence from Business Students in Latvia. RTU SCEE 2021, Riga, Latvia, 15/10/2021.
4. Nikitina, T., Licznarska, M., Ozoliņa-Ozola, I., and Lapiņa, I. Understanding Differences in Individual Entrepreneurial Orientation Between Business and STEM Students. Society of Open Innovation: Technology, Market and Complexity (SOI) 2021, 12/07/2021 (Riga, online).
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7. Nikitina, T., Lapiņa, I., and Ozoliņš, M. Relationship Between Managerial and Entrepreneurial Competences in Startups. 60th International Riga Technical University “Scientific Conference on Economics and Entrepreneurship, SCEE’2019, Riga, Latvia, 11/10/2019.
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13. Nīkitina, T. & Lapiņa, I. Contemporary Study Process for Enhancement of Employability in the Dynamic Environment. 21st World Multi-Conference on Systemics, Cybernetics and Informatics (WMSCI 2017), USA, Orlando, 8–11 July 2017.
14. Nīkitina, T. & Lapiņa, I. Overview of Trends and Developments in Business Education. 21st World Multi-Conference on Systemics, Cybernetics and Informatics (WMSCI 2017), USA, Orlando, 8–11 July 2017.
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### **Contents and volume of the Doctoral Thesis**

Chapter 1 “**Business Education and Trends in Higher Education Development**” provides a comprehensive review of the business education’s background, its institutions, stakeholders, and the environment where the actors operate. It describes accreditation standards and institutional ranking systems for HEIs in Europe and worldwide, presents statistics on the number of students in business education in Europe and over the globe, and outlines the interest groups and their interplay with business education bodies. The chapter explores the trends in business education implementation that are caused by transformations in the external environment. Contemporary competences for managers and entrepreneurs and entrepreneurship as a transversal competence are described at the end of the part. The qualitative content analysis and cluster analysis results processed by Nvivo to identify relations within the competence groups are presented at the end of the chapter.

Chapter 2 “**Entrepreneurial Orientation and Competence Development**” explores the professional competences required in the labor market, assessing in detail the importance. The

first part of the chapter presents the output of focus groups and interviews conducted with representatives of HEIs, BSIs, and entrepreneurs, as well as results of importance and performance analysis of the findings. The chapter presents the triangulation of the results of the literature analysis and interviews. The second part of the chapter discusses the results of the survey on the level of entrepreneurial orientation of the students. The obtained data set is processed by SPSS, and descriptive statistics methods were applied to identify the correlation between the elements of the composite entrepreneurial index, impact of HEI, and other essential factors.

Chapter 3 “**Enhancement of Business Education Implementation Based on Stakeholder Requirements**” in the first part examines different agile tools for system evaluation and decision making, including the methods, and their application in business education as well as the Essence approach for a system assessment and its adoption *per se*. The chapter describes the developed methodology for assessment of business education implementation and HEI continuous improvement, which is based on a decision-making approach borrowed as a cross-industry benchmark in the software development industry. The supporting tools and materials on how to make the system work are included in the chapter too. Finally, the chapter reports on the results of the application of the methodology to assess the output of business educational institutions in RTU Riga Business School (Latvia), EKA University of Applied Science (Latvia), Gdansk University of Technology (Poland), BA School of Business and Finance (Latvia), Poznan Technological University (Poland), and Faculty of Engineering Economics and Management, Riga Technical University (Latvia).

# **1. BUSINESS EDUCATION AND TRENDS IN HIGHER EDUCATION DEVELOPMENT**

## **1.1 Business Education Development**

To understand the role of business education and its underlying processes, an introduction to its historical background is required. The first institutions were founded at the beginning of the 17th century in Plymouth (Rosett, 2004) where students were trained primarily in book-keeping and business correspondence administration. Then the first elements of business education appeared in Germany in 1727, in Sweden in 1750, later in Russia (Moscow) in 1804, in France (Paris) in 1819, afterward in Austria (Vienna) and Hungary (Budapest) in 1856, and in 1868 in Italy (Venice) (Spender, 2016). Massively in Europe, the business education institutions appeared during the last two decades of the 19th century due to the changes in the European society that were brought by the Industrial Revolution when the full-time schools were found to increase qualifications of low and middle management “in trade, industry, and banking” (Reinisch & Frommberger, 2004).

Furthermore, the modern views on business education and the science of management were shaped later in the United States when in the 19th century the pioneers in the field were established: Wharton Business School at the University of Pennsylvania and the Haas School of Business at the University of California, Berkeley as well as the famous Harvard Business School (HBS) was founded in 1919, resulting in the establishment of 40 schools in the country by 1925 (Rosett, 2004). It is worth mentioning that the European influence on higher education institutions is significant these days, first, due to a significant number of educated Europeans immigrating to the United States; secondly, due to the opportunity to travel and study abroad. For instance, HBS’s first dean was Edwin Gay, who had taken his Ph.D. in Berlin, Germany (Spender, 2016). Regarding curricula of the new educational institutions, students were trained in foreign languages, English literature, philosophy, Latin, mathematics, and physics, and were trained in leadership, “economic and mercantile science” (Rossett, 2004), actual business practices, and techniques.

Nowadays, business education involves teaching students business management fundamentals, theories, and training in business practices. Curricula became more sophisticated and offer core courses in marketing, human resources, business ethics, and economics as well as provide a wide range of elective courses in other disciplines, including, for instance, management of non-profit organizations or entrepreneurship (Walter & Block, 2016). Some institutions provide advanced courses on strategic management of different organizations, such as family businesses, social enterprises, new technologies ventures, or start-ups. For example, London Business School (London Business School Programmes, n.d.) is ready to provide dedicated courses to teach future business administrators how to manage a growing business, handle mergers and acquisitions, or specialize in healthcare, sports, or entertainment. Hence the modern view of business education is represented in Merriam Webster dictionary (Definition of Business Education, n.d.) which states that business education comprises training in subjects

(such as business administration, finance, and accounting) that help develop general business knowledge or develop commercially valuable skills.

In order to evaluate the importance of business education and its role in the economy it is necessary to analyze the number of students enrolled to the relevant education programmes. The data below is essential as it emphasizes the actuality of the research in the context of European countries. It is important to note that across the EU-27, one-fifth of all students in the tertiary education were studying business, administration, or law, and the population is considered the largest field of study, which, consequently, explains the importance of the study for the economy of the region.

Although different countries demonstrated deviations at the country level, the number of students enrolled in tertiary education remained relatively stable in EU-27 within the last decade; for example, Poland reported 1.9 million enrolled students in the year 2013 and a half million less in the year 2019 – 1.4 million, or Belgium reported on 488 thousand students enrolled in the year 2013 and 30 thousand more in the year 2019 - 519 thousand students. By Eurostat, in 2013 the number enrolled in tertiary education was 17.2 million, and in 2019 – 16.9 million, see Table 22 in Appendix. In 2019, Germany — the most populous EU-27 Member State — had 3.3 million tertiary education students, the highest number in the EU-27 and equivalent to 17.9 % of the EU-27 total. France (15.0 % of the total), Spain (11.7 %), Italy (10.8 %), and Poland (8.5 %) respectively had the next largest tertiary student population. With respect to the countries participating in the research – in 2019 in Bulgaria were enrolled 229 thousand (1 % of the total), in Finland 295 thousand (2 %), 80 thousand in Latvia (0.5 %), 112 thousand in Lithuania (0.01 %), and in 2018 were 890 thousand in the Netherlands (5 %). As for Ukraine, in 2019 the country reported about 1.7 million enrolled students (Educationfair, n.d.).

The proportion of the students enrolled in tertiary education in business, administration and law demonstrate a similar pattern. In the EU-27, there were 3.9 million tertiary education students in 2019 and 3.7 in 2013, see Table 23 in Appendix. In 2019, Germany had 753 thousand tertiary education students studying business, France (672 thousand), Spain (425 thousand), Italy (350 thousand), and Poland (317 thousand) had the most prominent business students populations. It should be noted that the rising trends within the period demonstrated such countries as Germany (increase by 24 % from 607 thousand to 753 thousand enrolled business students), Greece (increase by 38 % from 119 thousand to 164 thousand), Cyprus (increase by 65% from 13 thousand to 21 thousand), or Portugal (increase by 10 % from 73 thousand to 81 thousand). In general, the proportion of business-oriented fields in European tertiary education contains approx. 22 % remains on the same level within the last decade (Fig. 2). With respect to the countries participating in the research – in 2019 in Bulgaria were enrolled 52 thousand (1 % of the total), in Finland 52 thousand (1 %), 22 thousand in Latvia (0.6 %), 29 thousand in Lithuania (0.01 %) and in 2018 in the Netherlands 203 thousand (5 %). As for Ukraine, for 2018 – 2019 the data is not available.

In 2018 women accounted for the majority of the total number of students within this field of education, 12.4 %, compared with 10 % of men studying in the field— see Fig. 6 in Appendix. The second most common field of education was engineering, manufacturing, and

construction-related studies, accounting for 15.8 % of all tertiary education students. In this field, almost three-quarters of all students were male. Some 11.6 % of all tertiary education students were men, compared with 4.2 % of women studying in this field, a difference of 7.4 percentage points. The third-largest field of study was health and welfare, with a 13.3 % portion of all tertiary education students.

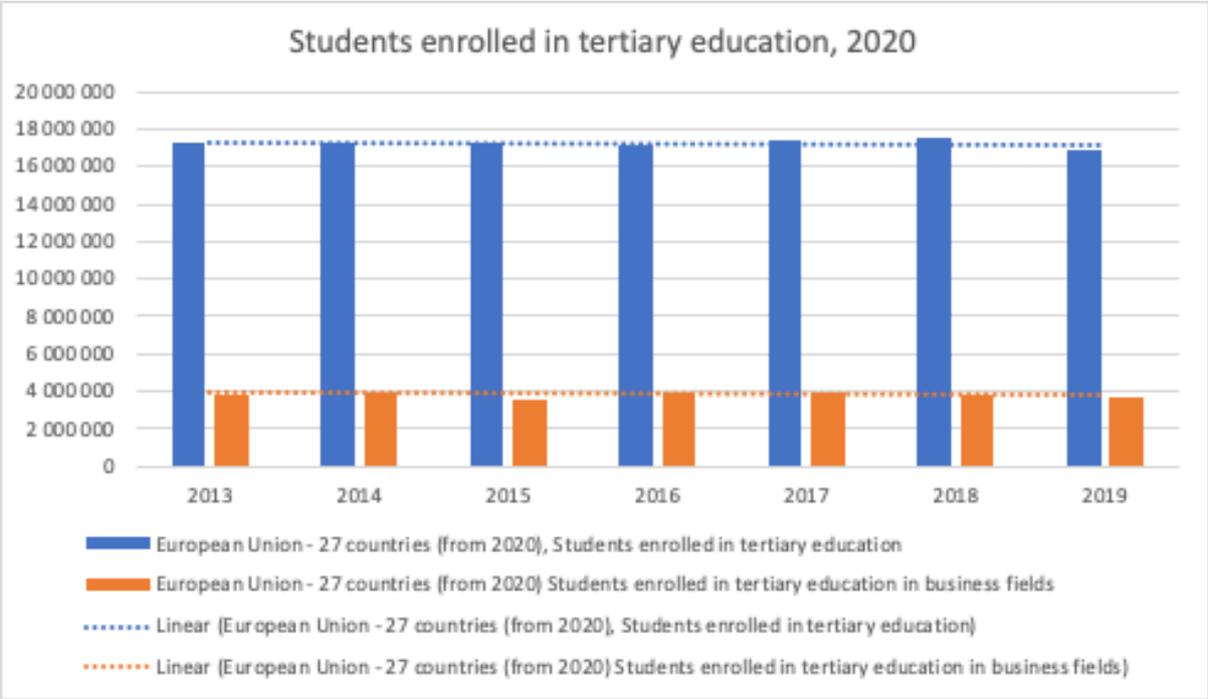


Fig. 1.1 Students enrolled in tertiary education, 2020

More than 4.0 million students graduated from the tertiary education institutions in the EU-27 in 2019. France (804 431) had the most significant number of tertiary graduates in 2019, some way ahead of Germany (649 520), Spain (458 528), and Poland (452 628), see Table 24 in Appendix. With respect to the countries participating in the research – in 2019 in Bulgaria were graduated 51 464 students (1 % of the total), in Finland 59 040 (1 %), in Latvia 14 848 (0.3 %), in Lithuania 25 031 (0.5 %) and in the Netherlands - 161 049 (3 %). As for Ukraine, for the period the data is not available. The analysis also shows that in 2019 almost a quarter of all tertiary students (1 million) graduated in business, administration, and law, see Table 25 in Appendix. As the share of 25 % is higher than the share of the tertiary students still in the process of studying within the field, 22 %, then it is possible to assume that fewer students started this type of study; the dropout rate or courses length also could have impacts on the numbers. Across the EU-27 member countries, the share of graduates in business is high in France, 27 % (277 110), Germany, 16 % (159 205), Poland, 11 % (107 177), and Spain, 9 % (88 298), followed by Italy, 7 % (73 890). Shares of the graduates in business studies from the other European countries are less than five percent per country. With respect to the countries participating in the research, in 2019 the shares of graduates in business are following, Bulgaria, 2% (15 878), Finland, 1% (11 091), Latvia, 0.4% (4 218), Lithuania, 0.6% (6 115), and the Netherlands, 4 % (43 981). As for Ukraine, for the period the data is not available. According

to Eurostat data, in 2018 the most frequently degree was awarded in management and administration (Fig. 6 in Appendix). Across the EU-27, 191 000 people in this field graduated with a bachelor's degree and 120 000 with a master's degree. Nursing and midwifery were the second most widespread course for those graduating with a bachelor's degree (98 000), followed by education science (80 000). Concerning Master's degree, medicine was the second most frequently awarded diploma among those graduates (112 000), followed by teacher training with subject specialization (51 000) and education science (48 000) accordingly.

Vocational secondary education and training (VET) programs prepare students for a career in a specific industry; VET is targeted at young adults and adults outside the labor market. The vocational qualification provides eligibility for higher education; it is possible to state that VET is geared towards both employment and education. Vocational education is usually provided by trade schools, technical schools, or community colleges. In the year 2019 total number of pupils enrolled in vocational upper secondary, and post-secondary non-tertiary education was 8.5 million, see Table 26 in Appendix. Italy had 1.5 million secondary vocational education students, Germany (1.2 million), France (1.1 million), Poland (664 thousand), and Spain (634 thousand) had the largest vocational secondary student populations. With respect to the countries participating in the research – Bulgaria (147 thousand), Finland (227 thousand), Latvia (24 thousand), Lithuania (17 thousand), and the Netherlands (566 thousand). VET is a substantial part of the educational system in Ukraine, in 2019, 254 thousand students were enrolled in upper secondary VET institutions (ETF, 2021).

Across the EU-27, 18% of the students were enrolled in business, administration, and law programs. Germany (375 184) had the most significant number of enrolled students in 2019, some way ahead of Italy (311 155), France (242 952), and Spain (90 204), see Table 27 in Appendix. With respect to the countries participating in the research – Bulgaria (12 485), Finland (39 884), Latvia (2 769), Lithuania (1 890), and the Netherlands (82 083). As for Ukraine, for the period the data is not available. More than 2.2 million students graduated from upper secondary vocational education in the EU-27 in 2019. France (562 198) had the most significant number of graduates in 2019, followed by Germany (320 041), Italy (299 830), Spain (191 368), and Poland (152 115), see Table 28 in Appendix. With respect to the countries participating in the research – Bulgaria (15 813), Finland (63 210), Latvia (3 734), Lithuania (4 431), and the Netherlands (141 501). As for Ukraine, for the period the data is not available. Similarly, to the tertiary education population, almost 20% of the graduates in EU-27 (or 445 006) got their diploma in business-related fields, see Table 29 in Appendix. Across the EU-27 member countries, the proportion of the students is distributed in an indistinguishable way in comparison to tertiary education: the share of upper secondary vocational education graduates in business is high in France, 27 % (121 451), Germany, 23 % (102 579), Italy, 15 % (66 359), and the Netherlands, 6 % (25 821), followed by Spain, 5 % (22 598). The shares of the graduates in business in the education segment from the other European countries are less than five percent per country. With respect to the countries participating in the research – Bulgaria (1 736), Finland (12 520), Latvia (465), and Lithuania (607). As for Ukraine, for the period the data is not available. To recapitulate, the review of the statistical data proves the jobs driven by digitalization and non-technological factors have become more complex and

flexible, which has led to a substantial number of organizations seeking employees with competence to manage complex information and allocate resources smartly, be creative, and communicate effectively.

Referring to the historical and actual background of business education in Latvia, the first university in the territory of Latvia (part of the Russian Empire at that time) was opened in Riga on 14.10.1862 - Riga Polytechnic (now Riga Technical University). It was the first technical university in the Baltics, modeled after the Zurich and Karlsruhe technical universities, the HEI had six departments including the Trade Department, which is a precursor of business education. In 1939 were also founded private universities - the Riga Commercial Institute and the Institute of Commercial Studies (Latvian National Encyclopedia, 2018). Since the restoration of independence in 1991, Latvian higher education has adapted to European and global higher education requirements, and the first business schools were founded: in 1991 was founded RTU Riga Business School, a management-education institution within Riga Technical University, then in 1992 was established Riga International School of Economics and Business Administration (RISEBA), a private international business school located in Riga, and later in 1994 opened their doors a subsidiary of the Stockholm School of Economics (SSE) in Riga. In accordance with Latvian Higher Education Quality Agency, today in Latvia operate 65 educational institutions providing with 156 accredited programs in the fields of real estate management, administration, and general management; the programs include first-level professional higher education study programs, professional and academic bachelor study programs, professional and academic master study programs, and doctoral studies (AIKA, 2022). Worth mentioning that there are 13 HEIs in Latvia, 11 in Riga, 1 in Ventspils, and 1 in Valmiera, offering 34 educational programs in business administration and management in English what makes local educational institutions competitive in the international market. Within the range there are 9 academic bachelor programs, 5 professional bachelor programs, 5 academic master's, 9 professional master's programs, and 6 doctoral programs. Apart from traditional General Management programs, the list of studies includes an educational program in Creative Industries and Growth Management (Latvian Academy of Culture), a study program in International Business with specialization in Export Management (University of Latvia), modules to learn Civil Construction and Real Estate Management (Riga Technical University), Tourism and Hospitality Management (Turība University) or International Business and Start-up Entrepreneurship (Rīga Stradiņš University). In 2021/2022 academic year the tuition fees per year vary for EU citizens for bachelor level studies from 1700 EUR to 6650 EUR, for master level studies from 2200 EUR to 16500 EUR, and for doctoral studies from 2570 EUR to 4500 EUR (Studyinlatvia, n.d.). In a study in 2019, 750 entrepreneurs from various industries and regions throughout Latvia evaluated higher education institutions that offer business education; Latvian businessmen ranked the University of Latvia (LU) (54%), Riga Technical University (RTU) (42%) and Business University "Turība" (30%) in the Top 3 (Forbesbaltics, 2020). With reference to the positioning in worldwide recognized professional ranking, then in accordance with Eduniversal's evaluation, which is made by the deans of 1000 of the world's best business schools, determining the best and most recognizable institution in each country, as the best business schools in Latvia in 2021 were selected RISEBA University of Business, Arts and

Technology, Riga Technical University (RTU) - Riga Business School (RBS) and Faculty of Engineering Economics and Management (FEEM), BA School of Business and Finance, and Latvia University - Faculty of Business, Management and Economics (Eduniversal, 2021).

To summarize, by examining the literature review in the previous sub-chapters the author explored business education system and identified its major institutions and their impact on the HEIs. The review of secondary sources for the exploration of the main stakeholders of HEIs and their perspective on business education is given in the next sub-chapter.

### 1.2 Business Education Environment and Stakeholders

Business education today is a complex system reflecting changes in the external environment and responding to the challenges rising over the globe. The business education HEIs operate to meet their stakeholders’ requirements and provide the service in accordance with quality assurance standards, as well as standards for HEIs and striving for a higher position in the institutions’ ranking. A schematic representation of the interrelations of the active influencers and enablers impacting business education is displayed on Fig. 1.2 below. The diagram portrays also examples of the agencies, associations, policymakers, and ranking bodies operating within the system; it has to be noted that the list is explanatory, and it is not intended to provide an ultimate list of the bodies.

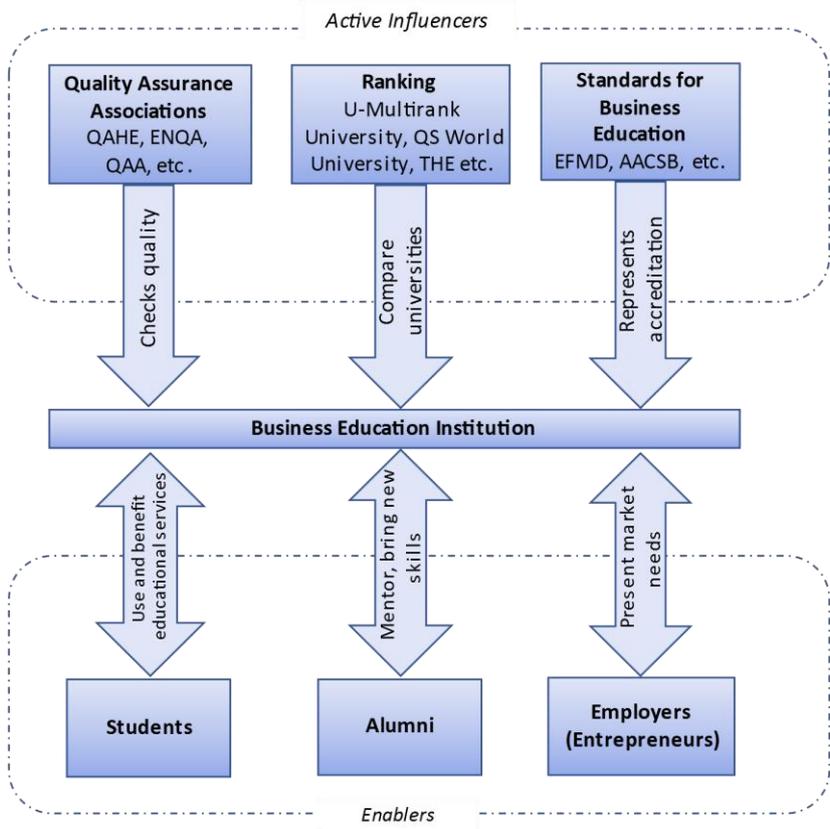


Fig. 1.2 Interrelations Between Active Influencers and Enablers Impacting Business Education HEI, created by the author

The understanding of business education not as a sole institution but as a complex network is highlighted by the University Business Cooperation (after that – UBC) – the collaboration of universities and businesses, assuming that this will foster innovation and entrepreneurialism (Straujuma *et al.*, 2016). Business education ecosystem reflects the changes in the external environment, and it is expected that future business leaders who are trained in higher education institutions will respond to the challenges from the surroundings. For example, Lapiņa *et al* argue that one of the issues that must be addressed by HEI (thereafter – HEIs) is employability of graduates. Traditional basis for academic education is theoretical knowledge hence the practical competences and skills that are expected by labour market from managers are not sufficiently presented in curricula and underdeveloped (Lapiņa *et al.*, 2015). Similarly, researchers (Plewa *et al.*, 2015) agree that collaboration between businesses, HEIs and students is the solution to improve the design of university programs which positively affects human capital development. The collaboration of the bodies assists in shaping entrepreneurial behavior and improves students' perception of educational experience.

Hence it is possible to state that development of business education is directly connected to development of society and its business needs as the entities strongly influence higher education institutions prospects, their curricula development, and expectations about the educational service quality. The interconnection and mutual impact of these bodies define the role of higher education in the modern society and generate new directions for the development of business education. Changes in the global external environment and the EU policies influence the development and management of business education that lead to its transformation.

To explain the matter of business education nowadays, the research question “What are the trends in business education implementation?” is proposed for exploration. This part of the research was conducted in the following steps:

1. The review of such secondary sources as the scientific journals, professional sources, books, conference proceedings and government documents has been compiled with the aim to investigate the modern interpretation of business educational institutions, their major stakeholders, and the latest changes in the field of study.
2. Qualitative content analysis of the interpretations of the competences that are subject to development for employability in modern organizations has been conducted.
3. Cluster analysis of the findings to clarify the relationship among the demanded competences has been undertaken.

### ***Institutional Quality and Regulatory Environment***

This part deals with description of regulatory bodies, quality assurance institutions, and performance drivers' institutions in the context of higher education. The section outlines the functions of the bodies, outlines their roles and impact in terms of the geographical allocation and number of members. It must be noted that in the scope of the research the institutional bodies are treated as stakeholders' groups that do not provide with their requirements, but prescribes limitations, methodologies, and boundaries. The stakeholders' groups are not affected by HEIs, instead of it, these bodies make impact on the institutions by themselves. The

stakeholders' groups communicating their requirements to business education and are affected by activities of business education HEIs are explored separately in the sub-chapter 1.2.

As was mentioned earlier and represented on the diagram of active influencers and enablers impacting business education HEIs (Fig. 1.2), on the worldwide, European, and country level there are bodies that regulate quality assurance criteria for higher education as well as there are bodies describing standards for business education. Business and management studies in higher education are traditionally divided into two levels: undergraduate, i.e., Bachelor's degree, graduate, or Master of Business Administration. Business topics in academic subjects are taught at different levels in almost all university programs and even in secondary education in many countries. Forerunners in the industry set standards and trends for others; for example, in the business education field, the European Business School rating is published in the Financial Times and regularly reports and announces high performers in the area. In their report in 2016, London Business School, HEC Paris, Insead in France and IE Business School in Spain, and the University of St. Gallen in Switzerland are considered the top performers. However, the complete list of business schools in Europe, including universities that offer studies in business administration or related areas, consists of more than 300 institutions (European Business School Ranking, 2016), including, for instance, one school of the new European Union member states like Lithuania, Slovakia, Serbia, and about 100 institutions in the United Kingdom. At the same time, it is worth mentioning that at a global level, the business schools that the Association has assessed to Advance Collegiate Schools of Business (hereafter referred to as – AACSB) or the European Foundation for Management Development (hereafter referred to as – EFMD) evaluation programs in some respect represent the highest standard of achievement for business schools worldwide. It was noticed that ordinary business schools that are not ranked highly establish partnerships with better-recognized HEIs to expand and develop networks outside the schools themselves, as a “business school is about whom you meet, not just what you learn” (Clark, 2014). By the AACSB (Society for Human Resource Management (hereafter referred to as – SHRM) and AACSB full report, 2020) data, there are more than 16,000 schools worldwide, and 5% have successfully earned the AACSB accreditation. 116 HEIs in Europe have passed the accreditation process successfully, including universities and schools in Bosnia and Herzegovina, Croatia, Poland, Slovenia, and Russia. HEIs from the Baltic countries also are members of the organization: four universities from Latvia, including Riga Technical University, three universities from Lithuania, and one institution from Estonia, are parts of the business education alliance. Concerning EFMD, the global non-profit organization unites 972 institutional members worldwide – 539 members are in Europe, while the rest are in Asia, North America, Central, and South America, Africa, Oceania and Australia, and the Middle East. The organization is considered an accreditation body for universities, business schools, and their programs. Twelve HEIs from the Baltic countries will be registered as EFMD members in 2021 (European Foundation for Management, n.d.).

It should be mentioned that apart from the worldwide level institutions within the last decades were founded number of regional level associations. For example, CEEMAN was established in 1993 as an international management development association aimed to accelerate the growth in quality of management development in central and eastern Europe.

Today CEEMAN has about 200 members from 50 countries in Europe, North America, Latin America, Africa, and Asia (Ceeman, n.d.). Another example is the Association of Asia-Pacific Business Schools (AAPBS) that was established in 2004 to help Asian Business Schools in their development and collaboration. (AABPS, n.d.) In addition to the organizations focused to the regional needs, there are bodies which mission is to promote the advancement of a specialized programs. For instance, with the assistance of AACSB in 1981 was formed the Executive MBA Council is an educational accreditation council, aiming to accredit schools of business offering EMBA degrees worldwide (EMBAC, n.d.). 230 thousand of students taking GMAT exam annually can be sure of the quality of the tests: an international non-profit organization of business schools, the Graduate Management Admission Council (GMAC), which was established in 1953, owns the Graduate Management Admission Test (GMAT), a standardized assessment that is widely used by graduate business administration programs, such as MBA, Master of Accountancy, Master of Finance, Master of Science in Business/Management, etc.) to measure quantitative, verbal, analytical and integrated reasoning skills in applicants (GMAC, n.d.).

It is worth mentioning that nowadays, business schools are not the only provider of leadership development and business management knowledge for potential students. In accordance to the AACSB report developed together with the Society for Human Resource Management (further in text SHRM) in 2020 (SHRM and AACSB full report, 2020), employers consider in-house development programs, professional development conferences and events, leadership coaches, and mentoring programs as more appealing educational providers in comparison with traditional degree programs in the sector. Even though employers consider business schools trustworthy partners, they value a more tailored and personalized approach. The findings contribute to stated earlier - the cooperation of business and educational institution is a valuable move in the business education system.

Describing the regulator bodies that make impact on education development process, worth mentioning the Bologna Process (European Higher Education Area and Bologna Process) which has been introduced all around the European Union and beyond and seen as an effort for uniting and making higher education areas transparent to address the challenges caused by the emerging globalization process. According to it (ibid.), European educators need to establish institutional mechanisms to transform knowledge production, innovation, and diffusion. The initiative is linked to the Lisbon strategy which defines education and competencies as core elements to develop businesses in Europe. The EU policies focus on several initiatives and instruments, including: 1) Europass - the single Union framework for the transparency of qualifications and competencies, 2) EQF - the European Qualifications Framework, 3) ECTS - the European Credit Transfer and Accumulation System, 4) EQAR - the European Quality Assurance Register for Higher Education, 5) ENQA - the European Association for Quality Assurance in Higher Education, 6) the provision of support to Union-wide networks and European non-governmental organizations (NGOs) active in education and training.

Along with the initiatives, the regulator developed and presented a framework which is known as the Dublin Descriptors. Aiming to level differences in educational programs on national levels the descriptors are general statements about the outcomes that are achieved by

students after completing their studies and obtaining a qualification, these descriptors are not assumed as minimal requirements but rather as reference points. The constructing elements of the framework are learning skills, communication skills, making judgements, knowledge and applying the knowledge (EHEA, 2005). To increase economy recovery from COVID-19 pandemic through acceleration of the individuals upskill or reskill, in 2021 European Commission recognized 'Micro-credential' meaning 'the record of the learning outcomes that a learner has acquired following a small volume of learning. These learning outcomes have been assessed against transparent and clearly defined standards' (Nuffic, 2022). National policies on the recognition of micro-qualifications are aligned - the size and workload of micro-credentials are shorter than that of regular degree programs.

However, changes in the business education landscape are more complex than those predefined by Bologna Process. The agreements between European countries are required to shape a framework to intensify the visibility of European higher education institutions and that those fit market worldwide. According to researchers (Jurše & Mulej, 2011), business schools today should act as a platform for different stakeholders networking and interactions on a global level.

As was already mentioned the business education has been influenced by changes in business environment, manufacturing, technologies. Apart from that, it is necessary to mention that there has been a change in the number of HEIs at a global level in recent years. HEIs in Europe demonstrate a trend for merging and consolidation due to resource optimization, development, and international competition as well as there is a decrease in the number of schools in the United States due to the reduction in the number of students; at the same time, there has been a steady growth in the number of educational institutions from mainland China as Chinese administration keeps investing heavily in the academic section to create competitive HEIs, retain students from studying abroad and attract individuals with research and development opportunities (University Mergers, online; ITP Report 2020, 2018; Ernst and Young report on Higher Education, 2016; Ministry of Education of the People's Republic of China, n.p.). Unlike most university education, which is highly dependent on national or EU funding, business education mostly depends on student tuition fees and business support. Therefore, the EU policies and programs less influence the field of business education than other study areas in HEIs.

The important stakeholder that significantly impacts the HEI system is the authorities responsible for quality assurance in education on global, European, and local levels. At the worldwide level, one of the most important bodies who assess universities compared to the UN's Sustainable Development goals is Times Higher Education (further in the text THE) ranking. The methodology contains calibrated indicators applied to research, outreach, and stewardship areas. Educational institutions sign off their institutional data for use in the rankings. The assessment provides institutions with an objective evaluation of the HEI's strengths and weaknesses and the performance assessment that helps in the continuous improvement and marketing of the institution. The ranking refines the search for partners for international students and educational bodies (Times Higher Education ranking methodology, online). Another internationally appraised and most-widely university ranking is QS World

University Ranking. Its score calculation is an alternative methodology based on six metrics application: academic and employer reputation of the university, its academic staff/student ratio, citations per academic staff, and international academic staff and student ratios (QS World University ranking, 2020 online). The same as THE, the score publications are released annually. At the European level U-Multirank rating is considered the unique ranking system to provide transparency on HEI performance. The methodology is based on the principle that “there is no theoretical or empirical justification for such composite scores” as universal weighted scores across different areas; that is why the authors of the method believe in the multidimensional user-driven approach and the comparison of institutions with similar activity profiles. The ranking is based on university self-reported data, student surveys, bibliometric and patent data, and publicly available data sources (U-Multirank University ranking, 2020, online).

As for business education, the accreditation provided by the Association to Advance Collegiate Schools of Business (further in the text AACSB) is considered a recognition of the highest standard of achievement for business schools worldwide. AACSB requires alignment with business accreditation standards focused on the mission, strategic management, innovation, support for students and academic staff, impact on society, and ethical leadership. The evaluation process is based on self-reported data and peer review. Contrary to the previously mentioned annual rankings, AACSB-certified institutions are subject to continuous improvement review processes every five years. The body regularly updates and publishes its guiding principles and standards for business accreditation used as industry guidelines for business education. For example, it describes suggestions for curriculum development, including competencies that have to be demonstrated by students. In the last version of the paper, in comparison to the previous recommendations, the organization engages in measuring learner success, ensuring their acquire competencies of thought leadership, solid analytical thinking, learning from experience, ethical and sustainable thinking, economic and financial literacy, and strong customer orientation (AACSB 2020 guidelines, 2020, online).

In Latvia, the supervision of higher education institutions is exercised by Quality Agency for Higher Education which carries out the function of quality assurance in higher education. The body assesses whether HEI can implement a study program in compliance with the regulatory requirements; the accreditation gives HEI the right to issue a state-recognized higher education diploma. The body oversees study program licensing, which means that students could be enrolled only in licensed programs. The agency is a member of the European Association for Quality Assurance in Higher Education (ENQA) (AIKA standards, 2020, online).

The other local authorities whose interests have to be considered by educational institutions are the Ministry of Education which develops standards for professions, and the Cabinet of Ministers, approving the standards. The document outlines the requirements for responsibilities, qualifications, knowledge, skills, and competences for every profession, which is listed in the official register (LR Ministry of Education, 2020). HEIs providing business education services have to consider Latvian Republic (LR) standard for Enterprise managers and LR Standard for Organization managers. Both measures include a demand for such competences as analytical

and systemic thinking, ability to cope with uncertainty, ethical and sustainable thinking, creativity and innovativeness, planning, and strategic management, as well as knowledge of labor and environmental laws, tax policy, cultural norms across various regions and countries and how such differences impact managerial decision-making (LR Organization Manager Professional Standard, 2020, online).

Concluding the sub-chapter about external factors influencing business education HEIs, it should be noted that in the European Union, education in business, entrepreneurship, and administration is incorporated into tertiary education and post-secondary non-tertiary educational programs. Tertiary education is provided by HEIs, which is the level of schooling following secondary schools. The following sub-chapter presents statistics data on the education institutions.

### ***Stakeholders***

Stakeholders' theory declares that an organization needs to consider the interests of multiple parties, including customers, employees, suppliers, and local communities. Understanding the stakeholders and creating a shared value is advantageous for an organization (Freeman *et al.*, 2018). According to the theory, stakeholders are the essence of "those groups without whose support the organization would cease to exist." According to Essence's methodology for systems assessment (Ivar Jacobson International, 2014), stakeholders are the people, groups, or organizations that affect or are affected by the system. Hence, understanding HEI as a system, the labour market could be defined as its main stakeholder and important factor influencing business education institution and the organization needs to react to the market needs as well as act proactively, providing with educational service that is harmonized with the stakeholders' requirements. Importance of stakeholder collaboration from the entrepreneurial ecosystem at HEIs as well as coordination of stakeholder collaboration and the overall approaches to stakeholder management are widely discussed (Bischoff *et al.*, 2018). Researchers agreed that HEI have to focus on the stakeholders' requirements to improve organizational processes and create added value meeting the stakeholders' satisfaction (Degtjarjova *et al.*, 2018). Some researchers pointed out that transformation of business education is possible only through the interventions of external stakeholders, whose made such contribution to business education as business ethics and corporate social responsibility (Lozano, 2022). Importance of the stakeholders management requires comprehension of the multiple elements of the business education system, their relationships, statuses, rhetorical activities, and returns that are expected by different groups. Hence it is possible to state that a holistic approach for the stakeholders management is essential. The first step is awareness of the stakeholders. The author of the Thesis assumes the stakeholders are represented by the following groups of interests: students, entrepreneurs, and authorities that regulate the quality assurance of HEIs. For the purpose of the research the author described the regulatory bodies, quality assurance institutions, and higher education ranking organizations in the previous sub-chapter. The groups of stakeholders having their requirements and being affected by output of business education will be described in the sections below.

### *Students*

As was already mentioned in the previous section, one-fifth of all students in Europe are studying business administration and management, the proportion is the most notable in comparison to other disciplines and remains unchangeable within the last decade, that attributes to the importance of the research. Students is the group of interests that are the clients of HEIs, they are direct beneficiary of the educational services provided by the organizations. The major interest of the group is to increase their success on the future job market acquiring both hard technical, professional and communication skills expected to be demonstrated and applied on the workplace. This group might be understood as investors whose allocate their resources for a couple or three years to develop competence that will boost their professional success. Similarly to the business angels, the students expect to gain yield: to assure their prompt employability and be prepared for the uncertain future through the learning experience and practical exercise. For example, enhancing students' entrepreneurial mindset through their innovative and creative thinking development, as well as forming of their entrepreneurial orientation, is one of the expected outcomes of educational service for the stakeholder group (Lindberg *et al.*, 2017). The following paragraphs outline the size of domestic market as well as global forecast for the industry and profile of the stakeholders' group.

The number of students in Latvia has decreased in the recent decade from 97 thousand in 2011 to 80 thousand in 2018, in both private and state HEIs. The drop by 17% is aligned with the decrease in the number of HEIs – from 54 to 48 for the same period. It is worth mentioning that there was a rise in the number of students in state educational institutions – from 71% in 2011 to 78% in 2018 (LR Ministry of Education, 2018). There are 25 students per 1 million inhabitants in Latvia, which is the highest number in the Baltics (15 students in Estonia and Lithuania) and is more extensive than in the neighbouring Scandinavian countries (Finland – 7, Norway, Sweden, Denmark – 3) (LR Ministry of Education, 2018; OECD Reviews on Innovation, 2017). According to the forecasts, an increase in the number of potential students is expected as in the next ten years a rise in the number of 19-year-old applicants is forecasted. From 2028 to 2031, there will be a slight decrease in the youth population; however, another ten years rise is expected in the number of secondary school graduates. It should be recalled that the fluctuations are aligned with the global trends, the UNESCO forecast observed the number of students will be enlarged by 50.5% and will reach 332,3 million in 2030 (UNESCO Institute for Statistics database, n.d.).

Demographic profile in the region is a dominant explaining the flux. The aging of the Latvian population and the decrease in its number due to natural causes are in the background of these changes in youth demographics that are described above (LR Central Statistical Bureau, n.d.; Eurostat (2019-2050) baseline projections, n.d.). There is a need to mention that the described situation is a part of a global trend where there is a declining trend in the number of childbirths and a rising trend in the projection of economically active population from 15 to 64 years old (World Population prospects, 2019, online), which corresponds to the trend of prolonged employability when 55 years old people tend to be an active player in the labour market (OECD Employment Outlook 2017, 2017, online). Responding to the global aging trend, the average age of a student increased to 26 years old; the change might be easily noted

among Master's students as for bachelor programs – there is no difference so far. Hence it is possible to note that despite the certain limitations in the number of first-time enrolled students, the more sophisticated demand for educational services will take place due to increasing number of requests for prolonged employability.

According to the UNESCO forecast, the overall number of international students will increase by 35,1% by 2030, which is almost 7 million scholars ready for mobility (StudyPortals, n.d.; UNESCO, 2017). The number of international students in Latvia remained stable within the last years – 6.7% on average from all the students; the number is two times higher than in Europe. However, there is a rising trend in European HEIs – from 2.6% of international students in 2012 to 3.2 in 2016 (UNESCO, 2017) respectively. The tendencies might lead to an increase in number of international students in the educational institutions and increase in competition among Latvian HEIs and Europe. What is interesting that in accordance with global data, there are also significant changes in the students' interests in the fields of studies during the last 20 years: there is a notable drop in the number of students who are interested in social sciences, business, and law - from 50% in 1998 to 35% in 2018, while the number of STEM students increased from 17% to 26% accordingly. The trend does not correspond to the general European level data.

Another considerable change is the rise in the number of students learning healthcare and services – from 3% in the late 90-ies to 23% in 2018. There is a decline in the interest in teaching and education management among the students – only 6% of youth are studying in the field, which is 13% less than twenty years ago (LR Central Statistical Bureau). It is important to note that according to the forecast of the Latvian Ministry of Economics (Latvian Ministry of Economics, 2018), the lack of highly educated STEM specialists in Latvia will increase to 17 thousand by 2025. The overall deficit of engineers in manufacturing connected industries will increase and reach 31 thousand. It is worth mentioning that from the year 2023, Latvian HEIs will meet the first generation of secondary school graduates whose competency-based educational programs are entirely different from the previous times (Latvijas Valsts Izglītības centrs, 2016; Skola 2030, n.d.). It might be expected that their requirements for HEIs and academic staff will be different and more demanding.

To conclude, regardless the topicality of the business education on European level, there is a certain decrease in interest to the field of studies on domestic Latvian market. The finding supports topicality of the research for the domestic organizations inquiring on how to retain the popularity of business education and make it consistent with the needs of the labour market.

### ***Alumni***

Alumni or graduates are considered to be all individuals who were the students of the HEI. These stakeholders have the highest level of commitment to the educational organization. The nature of their burden is rooted in shared values, a sense of belonging to their alma mater, and self-identification with the institutional body. The stakeholders are motivated to stay involved in HEI activities, and the “come back” concept often appears during the conversation associated with that duty, underlining a significant amount of nostalgia and a will to participate, collaborate and give support in different forms whenever it is needed (Pedro *et al.*, 2020). According to

recent studies, alumni have the highest level of assessment along the HEI's service quality dimensions, followed by the parents and the students. As to the level of satisfaction, these stakeholders have the highest level, followed by the parents and then the students (Valle, 2022). The specific stakeholders of HEIs are a valuable reference for the continuous improvement of business education - the recent graduates or alumni are seen as the most valuable source of information about all HEI activities. They are not only familiar with the processes they experienced but can also be good advocates for the HEI among youngsters and in society (Labanauskis & Ginevicius, 2017). The alma mater provides the alumni with an identity, organizes various events, and offers qualification improvement. The graduates provide HEIs with feedback and support, including lecturing for students and sharing practical experiences during events. Many studies emphasize the importance of the involvement of recent graduates and employers in evaluating the academic quality as customers and the critical mediation role of alumni participation is also revealed (Wu *et al.*, 2022). Policymakers recommend contemplating on these external stakeholders as an essential source of the expertise which can be used in entrepreneurial teaching and learning. Systematic engagement with graduates encourages long-term collaborative relationships that can provide valuable inputs to understanding future skills and help students' employability (OECD Supporting Entrepreneurship and Innovation in Higher Education in Hungary, 2017).

Concerning the numbers, the highest-ranking HEIs cooperate with their alumni association, have dedicated units for alumni relationship management or academic staff alumni club – by QS university ranking, the number is equal to 100% for TOP100 HEIs in the United States and 90% for European universities, ranked in the QS classification (QS World University ranking, 2020). The leading universities in the Baltics also understand the importance of a relationship with alumni: Riga Technical University, Latvian University, Stockholm School of Economics in Latvia, Vilnius Gediminas Technical University, Vilnius University, the Kaunas University of Technology in Lithuania, Tallinn University of Technology, University of Tartu, Estonian University of Life Sciences in Estonia, as well as other HEIs in the Baltic states have established tight contacts with their alumni.

To sum up, the stakeholders group might serve as a bridge between the educational institution and labour market acting as a facilitator for university and business cooperation.

### ***Entrepreneurs***

Entrepreneurs is a stakeholders group playing an important role in the forming of the labour market and as a result – affecting the higher educational bodies. On one hand, the entrepreneurs create the new working places, hence they form the demand for the new employees; on the other hand, entrepreneurship itself can be treated as a form of economic activity. Academic entrepreneurship and commercialization of knowledge generated at universities is one of the expected outcomes for the stakeholders' group (Cruz *et al.*, 2021). However, both options are related with labour force employability and as a result, requirements of the stakeholders are crucial for HEI disregarding the fact that the entrepreneurs are not treated as clients, paying tuition fee for the educational service. The following paragraphs outline the profile and perspectives of the group.

On the domestic level, according to the Latvian Statistic Bureau, 97% of the companies in the country were registered as small and medium enterprises, and their total number was equal to almost 170 thousand; 2% of the firms reported more than 20 but less than 50, and just 1% of the enterprises were not registered as SMEs in the 2017 year (LR Central Statistical Bureau). The proportion does not differ from the situation in Europe, where 96,9% of companies in 2016 were registered as SMEs (Eurostat database on SME, n.d.). From 2014 to 2018, the number of newly registered companies decreased from 15 to 10 thousand, while the number of closed companies tripled from 6401 to 20746. The closed companies represented the logistics, construction, and catering industries. As per Lursoft, the number of international investors remains at the same level. However, the number of investors from India doubled; Russia, Ukraine, Lithuania, and Estonia remain among the other most popular countries in which representatives register companies in Latvia (Lursoft, 2019).

The Latvian entrepreneurship ecosystem consists of multilingual (often with at least three languages or more) talented people of various ages and backgrounds. The start-up environment is dynamic and rapidly growing. The main actors of the entrepreneurship ecosystem in Latvia – government, academia, and capital – support the start-up ecosystem due to the increasing role of start-ups in the national economy. The support of innovative companies is one of the government's priorities; it is defined in the national level planning documents such as the Sustainable Development Strategy of Latvia until 2030, the National Development Plan 2014-2020, and the Government Action Plan. Business incubators are great contributors to the growth of the entrepreneurial spirit in the central regions of Latvia. There are over 25 business incubators, of which 15 are government-led, 11 are under the umbrella of universities, and there are four private business incubators. Three are “Kurzemes Business Incubator” in western Latvia, the one operating within “Ventspils HighTech Park.” The Latvian start-up infrastructure consists of more than 400 registered start-ups, a pool of institutional investors and business angels, a diverse range of modern co-working spaces, and dozens of business incubators (Magnetic Latvia, 2020; Rostoka *et al.*, 2019) supported by the government, academia, and private individuals.

According to the research conducted by RTU scientists in 2013 (Lapiņa *et al.*, 2017), companies in the Czech Republic, Latvia, Portugal, Spain, and the United Kingdom were asked about the abilities, skills, and knowledge considered essential for the development of the current employment and the possible jobs in the future, so they rated the importance of the skills from 1 (not important) to 4 (very important). All the abilities and skills were divided into five groups: personal qualities/attributes, communication skills, human relations, interpersonal skills, research and planning skills, and leadership and management skills. Almost all personal qualities given in the questionnaire were valued as important or very important. Two qualities – responsibility, willingness, and desire to work and learn – stand out as most appreciated. This refers to the other qualities acquired during work or maybe less critical for the jobs assessed.

All communication skills are rated as necessary for the activity development and listening to others is ranked as the most important. The respondents noted that communication itself is crucial and especially highlighted listening to others, which may be associated with an employee's ability to perceive, understand, and execute the given tasks. As well as this, all

human relations and interpersonal skills were valued as significant. The most outstanding talent is the capability to satisfy the customer needs – dealing with complaints and listening to feedback – cooperation and teamwork. Those are very much connected and complementary skills, as customer satisfaction should be the goal of all the company's employees. Research and planning skills were rated as essential, and the highest-ranked positions are for those related to quality and market demands, e.g., deadlines and problem-solving. Nowadays, problem-solving skill is necessary. According to employers, it was also named the primary employee skill according to the OECD Top 10 skills for future jobs (Vincent-Lancrin, 2016). Leadership and management skills were highly valued; they are important; flexibility, overcoming difficulties, and professional competences were valued slightly higher than others.

Although the survey was limited to the fields of activities of the project partners in their regions, the main conclusions obtained are aligned with the European trends regarding forecasting skill demands and job openings according to the European Centre for the Development of Vocational Training (CEDEFOP, 2016) studies. Hence it is possible to conclude that all the companies pointed out lifelong learning as most valued and claimed the need for skilled employees. Yet, the job market is very volatile, and the output of educational institutions does not always meet companies' requirements. It should be noted that companies pointed out lifelong learning as most valued by them.

By examining the literature review in the present sub-chapters, the author explored the stakeholders of business educational institutions. She investigated students, entrepreneurs, and alumni as the main stakeholders of HEIs and their interests. It should be noted that there is a significant increase in the number of international students and scholars' mobility; there is a notable drop in the number of students who are interested in social sciences, business, and law on domestic market - from 50% in 1998 to 35% in 2018, while the number of STEM students increased from 17% to 26%. With respect to alumni, the stakeholders' groups are motivated to stay involved in HEI activities to participate, collaborate, and give support in different forms; the high-ranking HEIs worldwide cooperate with their alumni associations and have dedicated units for alumni relationship management or academic staff alumni clubs. Average 97% of the companies in the EU and beyond are registered as small and medium enterprises; the companies claim the job market is very volatile and report on the need for constant training for new skills.

Based on the literature analysis, the next subchapter investigates the changes in the external environment and business education within the last decade and introduces the competences required to lead modern organizations.

### **1.3 Trends in Business Education Implementation**

As was already mentioned in the previous sub-chapters, the groups of interests represent interests, expectations, and regulations that are subject to change due to transformations in external environment. Recent changes in the external surroundings, such as Internationalization of education, technological innovations, and labour market demands for new skills, inevitably lead to a shift in perception about business education and society's expectations about the institutions. Some researchers (Remišova *et al.*, 2014) also mention that modern business

schools integrate subjects which are not related to business administration directly but indirectly, for example, ethics into curricula. The importance of developing academic or practical knowledge and skills, such as the ability for creative problem solving, are crucial for business students as potential enablers of innovations (Schlee & Harich, 2014). Apart from this, researchers have observed that business schools have launched different programs during the last decade and adjusted their curricula and campus experience to address the ethnic and cultural differences of their students (Zhang *et al.*, 2016). Internationalization has become a part of HEI strategies across the globe – partnership agreements between educational institutions, attracting talents worldwide, and the definition of criteria that are a basis for international cooperation with other organizations (University of Melbourne, 2017; KTH, 2020). Addressing the new teaching challenges, the academic staff of business schools must re-assess their teaching methods; some of the schools have already included dramatic arts to deliver courses on leadership (Mabey *et al.*, 2015, Oganisjana *et al.*, 2021), while others create business projects to intensify a project-based learning method with virtual entrepreneurial experience (Rossano *et al.*, 2016).

Table 1.1

Trends in Implementation of Business Education ,(created by the author)

<b>Business education trends</b>	<b>Examples</b>
Partnership and networking	With HEIs, educational technology organizations, business entities, external stakeholders
Curricula are highly responsive to the needs of society and business	Including subjects that are not related to business administration directly (such as ethics or sustainability topics), and improving creativity and problem-solving skills
	Including specifically designed courses to reflect multiculturalism and mobility of students
Flexible teaching methods	Online education, dramatic arts, problem-based learning, project-based learning, virtual business projects
	Different methods for different international students to increase their cultural and academic competences

Hereafter, it is possible to conclude that business education today is not only training in subjects for further business administration but also a partnership with different stakeholders, networking, actualized curricula, and flexible teaching methods. The summary is represented in Table 1.1.

The trends are grouped in Fig. 1.3, while a detailed description of the groups is found in the sub-chapters below.

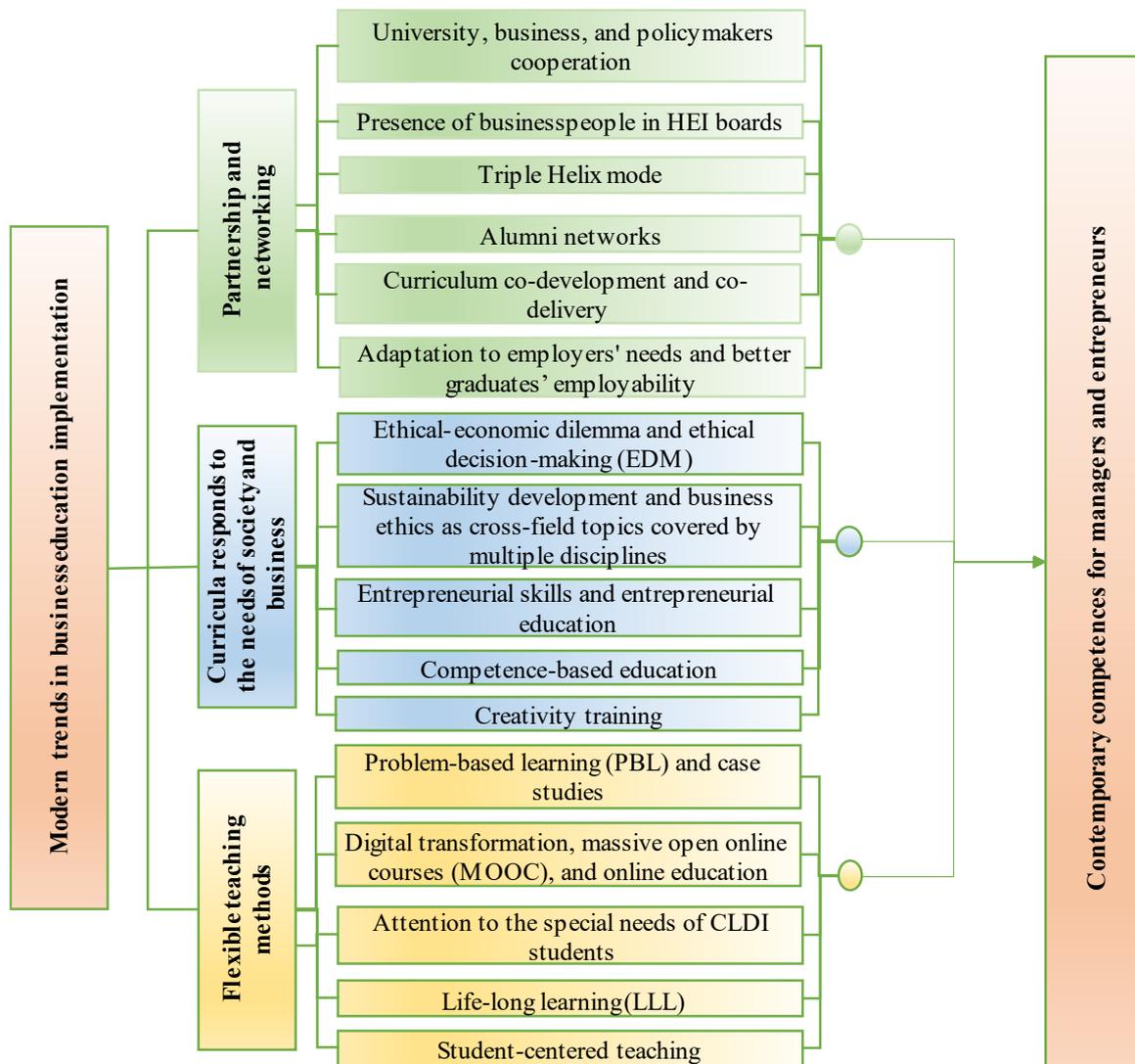


Fig. 1.3 Implementation of Modern Trends in Business Education

### 1.3.1 Partnership and Network

Researchers (Plewa *et al.*, 2015, Deželan *et al.*, 2016) identified the urgency of engaging businesses in curriculum development and delivery, so the collaboration of business schools, businesspeople, alumni networking, focus on developing or improving the senior management relationships as well as the presence of businesspeople on HEI boards or participation of academics in the boards of business organizations in addition to internships. As the value of business education is becoming questionable by many stakeholders, including employers, questioning the utility of contemporary business education (Owen *et al.*, 2021), these practical and mentoring relationships help to build a strategic platform for cooperation and serve for the external promotion of collaboration between universities, businesses, policymakers, and society. Collaboration between universities, SMEs, and NGOs (Pavlin, 2016). Gawel (Gawel, 2014) noted a successful collaboration between universities and companies when preparing case studies. Researchers (Gulbrandsen & Solesvik, 2015) believe that HEIs are equal partners in a “triple helix of university-industry-government relations.” The EU report on the state of University-Business Cooperation in Europe emphasizes the following benefits of the

cooperation for the parties: curriculum co-development, students' mobility, long-life learning for employees, collaboration on research and development, consulting projects with business, academic, and students' entrepreneurship and industry support (EU, 2018). Research (Quintana *et al.*, 2016) reports that students benefit from university and business cooperation due to the involvement in innovative and entrepreneurial activities through internships, conferences, research projects, seminars, and consequently applying their knowledge in the real business environment. External stakeholders - employers, suppliers, and communities – contribute towards the understanding of the role of business in society and in the educational value chain; stakeholders inclusion develops both practical and ethical mindset of the students who want not an ordinary job, but a career with meaning (Keegan, 2022). As a result, all these actions help increase the level of satisfaction of companies with their employees' abilities (Gawel, 2014) and increase students' employability (Pavlin *et al.*, 2016) as educational service corresponds to the labour market requirements for the competencies (Petrov *et al.*, 2022).

Additionally, a dialogue between universities and businesses is required to increase the quality of entrepreneurship education and the number of start-ups in countries where entrepreneurship-hostile environments motivate policymakers to promote entrepreneurship education (Walter & Block, 2016). It has been discovered that investments in student mobility between universities or temporary movement of students from universities to business and collaborative research and applications could support a positive engagement between the parties (Deželan *et al.*, 2016; Galan & Plewa, 2016). The role of multiple stakeholders' collaboration to strengthen the relationship between international business practice, research, and education for the benefit of all parties involved has been accelerating recently due to the Covid-19 crisis (Tuninga, 2022).

Unfortunately, sometimes HEIs do not have the skill set or the facilities to meet the needs of the business (Pavlin, 2016). The academic rigidity and the lack of proactive strategies of the higher education institutions to determine business and government involvement are barriers to cooperation. It is interesting that even if academics perceive no barriers, they still may not cooperate with the company if there are no drivers in place (Galan & Plewa, 2016). The following sub-chapter explores the outcomes of successful partnership and network communication.

### **1.3.2 Curricula Development**

Due to the urgency of solutions to ethical-economic dilemmas and ethical decision-making (after that – EDM) in business, researchers (Remišova *et al.*, 2014) observe the impact of the factors on leadership studies in the current business environment. It is considered insufficient to include a course on business ethics as an elective course in business schools' curricula, but now it is time for cross-field cooperation between various disciplines. Sustainable development goals, introduced by the UN to face global challenges (United Nations, 2020), enhance the topicality of ethical and sustainability-oriented thinking and its integration in the educational value chain through provisioning of formal training for sustainability development and value co-creation activities increasing sustainability literacy (Cavalcanti-Bandos *et al.*, 2021; Farias *et al.*, 2022; Tien *et al.*, 2022) and advancing pro-environmental attitudes and practices among

the young professionals (Yang *et al.*, 2021). Hence HEIs build their strategies, including sustainability concept development across the whole organization, learning process, and environment (Riga Technical University, 2020).

The fundamental movements and events in the external environment enable the development of business education. Corporate bankruptcy scandals within the last 15 years allowed many researchers to criticize the moral and ethical aspects of business education (Bennis & O'Toole, 2006; Colby *et al.*, 2011; Datar *et al.*, 2010; Li, 2010). Therefore, many researchers reveal the importance of addressing ethical issues in business education (Remišova *et al.*, 2014), (Mabey *et al.*, 2015) and even uncover new directions in leadership pedagogy (Collinson & Tourish, 2015) to increase the role of HEIs in society. According to the researchers (Lilley *et al.*, 2014), global citizen learning supports a global business mindset and the level of employability aimed for in business schools.

Another aspect which is notable in the countries with limited experience in the open market economy is the improvement of entrepreneurship education is a response to the industry and policy makers' demand for a theoretical basis for developing and implementing a national-level strategic plan of entrepreneurship education (Bikše *et al.*, 2014, 2016; Song *et al.*, 2021) which leads to encouraging the development of students' entrepreneurial competences and promoting entrepreneurship in the community (Wang, 2021). In the Baltic states, students have expressed a need for more extensive information about entrepreneurship, especially about social entrepreneurship, as many of them are interested in their entrepreneurship skills assessment and development as a potential asset for running their businesses (Melnikova & Zaščerinska, 2016; Okolie *et al.*, 2021) Hereafter, this is a call for competence-based education that universities should address in their curricula. Entrepreneurial skills development is crucial for students' employability and serves for better job matching for college graduates (Pavlin *et al.*, 2016); hence the establishment of more demanding higher education programs leads to the ability of the graduates to build human capital in the organizations of their employers. Apart from entrepreneurial skills, training in a greater variety of dimensions of creative thinking and creativity exercises is required for business students to improve their ability to generate innovative ideas, shift from one idea to another, or change their perspective and come up with original solutions (Schlee & Harich, 2014).

The next sub-chapter will explore the contemporary teaching methods that are required to deliver the curricula that are created by the different stakeholders.

### **1.3.3 Contemporary Teaching Methods**

Pavlin, in his article "Considering University-Business Cooperation Modes from the Perspective of Enterprises," suggested adjusting HEI's curricula to develop student competences, i.e., to combine the traditional teaching method with extensive cooperation with the industry considering student mobility between the academic and professional environments in the form of an internship or direct recruitment, therefore training and short courses might be optional forms of an educational content delivery (Pavlin, 2016). Digitalization requires HEIs to stay relevant in the digital age and change class-based courses to e-learning courses and automate processes, provide online services to students, support and develop digital platforms

for research and virtual learning groups (PwC, 2015; Cisco, 2016). Disregarding the fact that IT-based solutions and services are developing very rapidly, and the global online education market is expected to grow by the year 2023 at 24% annually (Digital Journal, 2017), there is still no common approach among business schools to the integration of online programs into school programs. As to the use of IT in business education, some HEIs ponder on possible cooperation with the educational online platform Coursera (Lombardi, 2013), and business schools, including highly ranked MBA programs, use IT technologies to deliver MBA programs content online, without the on-site experience (Whitaker *et al.*, 2016). Technological innovations and the internet have changed the methods of business education delivery - massive open online courses (MOOC) have made MBA programs affordable and more popular than campus-based (Clark, 2014). It is also worth mentioning that the English language is not the sole option for learners as MOOCs are delivered in native languages too (Kim, 2015). The use of IT in business education is heavily dependent on student learning style, design of the courses, and institutional environment (Whitaker *et al.*, 2016). While Wharton and Stanford have experimented with massive open online courses and allow MBA courses on a no-pay basis, many highly ranked schools do not offer online degrees which give a certain opportunity to less well-known schools (Clark, 2014). Hereafter, the modern HEIs need to undertake some actions for gaining experience with online education and choose the most appropriate role for their organizations (Whitaker *et al.*, 2016). E-education at higher education institutions helps cut costs and its importance will continue growing in the future (Ščeuļovs *et al.*, 2015). It is important to note that the role of the digital learning industry has increased significantly within the last decades. Since 2000, the digital learning industry has grown by 900%, making it the fastest-growing market in the education industry (KPMG report, 2015). The recent Covid-19 pandemic prompted exponential growth in the eLearning industry as educational institutions and businesses adopted online learning tools to improve students' and employees' engagement and learning experience (GMI report, 2020). Educational technologies applied to online education make it more authentic, practical, and attractive for students. It offers a setting to acquire practical competences and experiences via the “learning by doing” method. The educational technology (EdTech) platforms have become a new form of institution that provides plenty of online business education courses. Coursera, EdX, and Udemy offer most of the methods: in terms of several learning products, levels, and available languages, Coursera is considered to be the biggest platform for the development of competence in business administration and entrepreneurship – 192 courses, 3 degrees, 28 specializations, Mastertrack™ Certification in 31 languages for different levels of the students. Udemy has the most considerable amount of entrepreneurship learning products (1834 items) in comparison to other platforms (Chen *et al.*, 2021). However, despite the efforts in the amplification of digital literacy among the undergraduates, the impacts of COVID-19 exposed the reality that many institutions, professors, and HEI students were under-prepared for the reliance on digital technologies (Murray *et al.*, 2022). Hence the implementation of technology-supported teaching and learning and the rethinking of the present content is a challenge and an opportunity for students and academic staff for further digital transformation (Kamsaker *et al.*, 2020). However, both lecturers' and students' digital transformation was accelerated and intensified due to the

global structural changes caused by COVID-19 pandemic, including the emerge of academic entrepreneurship, which has speeded up over the years (Garcez *et al.*, 2022).

Technologies are not the only factors affecting changes in course delivery methods. As society demands to teach leadership critically, enable ethical leadership practice for all the parties involved including employers and policymakers (Mabey *et al.*, 2015), it is important to avoid the old-fashioned tendency for storytelling about charismatic leaders to de-romanticize the factor of power in leadership in the eyes of the future business leaders. Hence, problem-based learning and case studies are the most actual methods to deliver courses on leadership (Collinson & Tourish, 2015) teaching methods should foster students’ creativity, systems thinking, proactive attitude, teamwork, and long-term thinking (Dimante *et al.*, 2016).

Besides the challenges caused by MOOC development and the call for ethical leadership, business schools cannot ignore cultural and linguistic diversity in students and its different levels of compliance with domestic educational norms and the labor market’s requirements.

Globalization and internationalization of the modern world is an important aspect that affects business education on the global level. As the proportion of foreign students on the campus has been steadily and gradually increasing within the last decades, it is required to manage students’ diversity to tackle the gap between the local and culturally and linguistically diverse international (CLDI) students. Therefore, diversity on campus has been a focus of attention and the academic staff members who have not aligned the curriculum are suggested to adjust their teaching practices to the needs of the growing number of international students (Zhang *et al.*, 2016; Jagadeesha *et al.*, 2020).

Table 1.2

Groups of Trends Based on Mapping Literature Review

<b>Trend</b>	<b>Sub-trends</b>
Triple helix model /University, business, and policymakers' cooperation	Adjustments in curricula to increase employability
	Cooperation between universities, businesses, and policy makers
	Importance of connections with industry
	Collaborative research
	Importance of dedicated resource allocation to maintain the relationships between academic staff and business
	Curriculum design and development
	HEI image in labour market
Competence-based education	Development of entrepreneurial competences
	Generating productive innovation
	Importance of competence-based education
Teaching challenges	Problem-based/case-based learning
	Academic staff development to understand entrepreneurship education
Leadership	Ethical leadership

<b>Trend</b>	<b>Sub-trends</b>
	Critically assessed role of the leader in a modern organization
	Ethical decision making
Online education & Massive Open Online Courses (MOOCs)	Assessing HEI strategy to define the role of online education
	Important role of online education
Funding issues	Limited funding in HEI
	Free education
Other	Lifelong learning
	Corporate social responsibility
	Presence of international students on campus

As already mentioned, entrepreneurship education is a new educational perspective that cannot be ignored by HEIs, however, extending curricula by the inclusion of topics such as corporate entrepreneurship is not enough. Researchers (Walter & Block, 2016) caution against using start-up experience alone because the quality of entrepreneurship education across countries is conditioned by the national institutional context and has a particularly strong effect in entrepreneurship-hostile environments, that is why researchers recommend a cluster of investments, rather than a targeted investment (Deželan, 2016). The significance of student-oriented teaching and learning is described by many scientists (Gawel, 2014,), (Collinson & Tourish, 2015), (Mabey *et al.*, 2015), (Wolfe, 1998) - practical orientation of HEI better prepares students for their future and impacts positively on employability as well as student satisfaction with their potential workplace. For example, applying the Intended Learning Outcome (ILO) approach for a course on Entrepreneurship contributes to students' ability to develop and present a business plan for business angels' review, explain the process for developing a new business venture, or reflect on their capacity as an entrepreneur (Pardede & Lyons, 2012).

In the aging world, where seniors live and work longer, educational programs ought to benefit older adults (OECD, 2019), hence lifelong learning has been developing to become one of the top priorities for many higher education institutions (Rossano *et al.*, 2016), (Galan & Plewa, 2016), therefore, the stage for the new transversal skills development should be set in HEIs. Problem-based learning (thereafter – PBL) which requires the active participation of learners is one of the cornerstones which shifts the focus from teacher-driven education to student-centered learning and helps to develop the ability for lifelong learning. Collaborative learning, solving of real-life problems, teamwork, work-based learning, and professional mentoring are the new approaches the academic staff could adapt to develop graduates' competences and behavior (Quintana *et al.*, 2016). Apart from it the course delivery over the internet, life-long education, the importance of interpersonal (and other) skills development for business students, match of education and future occupation, and international orientation of business schools have been researched quite substantially. The influence of alumni networks and corporate social responsibility on business education is considered less researched and is

subject to further studies. In Table 1.2 there are grouped findings on the major trends and their sub-trends. Hence, answering the question “What are the current trends in business education implementation?”, the following observations have been made: 1) University and business cooperation (UBC), as well as university, business, and policy makers’ synergy and Triple Helix model implementation, are widely discussed addressing it from different perspectives, such as: 1a) Adjustments in curricula to respond to labour market challenges; 1b) Importance of connections and relationships between the parties; 1c) Significance of collaborative research and case studies development; 2) The importance of competence-based education is raised, especially the development of entrepreneurial competences; 3) The problem-based or case-based teaching method is evaluated as significant for the student-oriented approach.

#### **1.3.4 Entrepreneurship as a Transversal Competence**

Referring to the stated above the author makes an observation that the modern trends in business education implementation were segmented in accordance to their partnership and networking nature, contemporary teaching methods, and curricula adjustments as a result of cooperation with external influencers and other stakeholders are aimed to the students’ competences transformation and development the contemporary competence for managers and entrepreneurs.

In 2014 UNESCO developed guidelines for education policymakers where describing transversal skills is increasingly in high demand for learners to adapt to changes and successfully lead meaningful and productive lives. Regarding employability, the international organization identified the hard ones, technical and analytical, that allow the worker to perform the technical aspects of the job. Soft skills, or transversal skills, are defined as personal qualities required to be effective in any workplace; hence these skills cut across jobs and sectors (European Union Commission, 2011; UNESCO International Bureau of Education, 2013). The agency defined transversal skills as the “skills that are typically considered as not specifically related to a particular job, task, academic discipline, or area of knowledge and that can be used in a wide variety of situations and work settings (for example, organizational skills)” (UNESCO, 2014). For sustainable development, UNESCO recommended to educational bodies to include the skills development in all formal education curricula, from primary to higher education, and emphasized that the learner should be able to “recognize the importance of their skills for improving their life, in particular for employment and entrepreneurship” (UNESCO, 2017). CEDEFOP indicator shows that the most demanded transversal skills are communication skills, teamwork skills, customer handling skills, problem-solving skills, learning skills, and planning and organization skills, which are essential (CEDEFOP, 2022).

Regarding transversal competences, the EU recommends enhancing creativity and innovation, including entrepreneurship at all levels of education and training (European Union, 2019). Researchers pointed out that the development of education for sustainability requires encouraging entrepreneurial skills and transversal competencies in HEIs: universities and business schools offer programs in entrepreneurship or courses to teach students how to identify opportunities, estimate the resources required, acquire them and start up a new business (Gielnik & Oyugi, 2015). Other researchers describe the intended learning outcome for training

in entrepreneurship as the student's ability to develop and present a business plan for business angels' review, explain the process for creating a new business venture, or reflect on their capacity as an entrepreneur (Pardede & Lyons, 2012). Many researchers point out that problem-based learning is a beneficial method for developing transversal skills, for example, presentation skills, self-management, or project management skills, repeating that these are applicable in any industry and many occupations; hence it is possible to conclude that the development of these skills would have a positive effect on the student employability (Pavlin *et al.*, 2016; Rossano *et al.*, 2016). For example, in research designed for identifying which abilities, skills and knowledge are essential for the employees, i.e., the most critical transversal competences for the companies and the identification of training needs conducted by RTU researchers with partners from Turkey, Hungary, Finland, and Spain were identified that among all the participants in the survey, companies other than those in Latvia selected entrepreneurship and leadership as the subjects where they needed coaching/training most; the research showed that in general overall demands are becoming more competence-based in all categories, there is a greater need for such transversal skills as the willingness and desire to work and to learn, responsibility, communication, satisfying consumer needs, cooperation and team working, giving priorities to tasks and problem-solving, when it comes to management positions, strategic thinking, and quick decision-making were chosen as essential (Lapiņa *et al.*, 2017).

It should be noted that the development of entrepreneurship competence is assumed as a part of national policy in EU countries. For example, Latvian national educational guidelines stress the importance of developing transversal competences, such as critical thinking, problem-solving, creativity, and entrepreneurialism (OECD, 2020). In Latvia, the young generation can improve their business competences by getting involved in Erasmus+ youth exchange projects, mobility projects for youth workers, and projects promoting youth entrepreneurship, especially social entrepreneurship. For pupils in grades 4–12, a particular training program was developed to help the kids acquire skills to establish and manage an enterprise, marketing, and product development. 22% of graduates of the program went in for business. In Latvia, the program is represented by Junior Achievement Latvia, which holds a license of the Junior Achievement Worldwide program. It is a public organization and an expert on practical business education in Latvian schools. Annually, the organization provides useful business education programs to 60,000 pupils in Latvia; apart from it, the body ensures education programs for the teachers (EUYouthwiki, 2019). Apart from it, there are a few ongoing initiatives addressing entrepreneurship education at the secondary or even primary level, such as the Innovative Business Motivation Program, supported by the Investment and Development Agency of Latvia, and Euroskills Students Competition, sponsored by the Ministry of Education of Latvia (EU Erasmus+ School Education Getaway, 2015).

The researchers who explored entrepreneurship in Latvia and the other Baltic countries in the post-Soviet era from 1996 to 2014 acknowledged that entrepreneurial activity adjusted relatively quickly in these countries, but at the same time, entrepreneurial activity in Latvia “tends to increase owing to the fall in corruption and greater financial development.” (Brás, 2020). Later researchers pointed out that gradual economic recovery between 2005 and 2015 encouraged “a fertile ground for examining how entrepreneurship is affected by the business

cycle” that resulted in the rising of early-stage entrepreneurial activities primarily by necessity-driven entrepreneurship (Krūmiņa & Paalzow, 2017).

Many HEIs foster their entrepreneurial ecosystems by re-mastering study programs or conducting projects that include students, academic staff, and business representatives (Manning, 2018; Ozoliņš *et al.*, 2018) to enforce cooperation between educational institutions and the industry. The steps are required for business services are strongly correlated to each other and make an impact on the quality of increase the value of human capital and consequently contribute to the growth of entrepreneurial companies, as researchers are unanimous - education, new firms, and the ecosystem (Stam and van de Ven, 2021). The initiatives supporting entrepreneurial efforts are especially valuable in developing countries where stakeholders need to focus on informing young people about start-up activities to ensure the innovation-driven type of entrepreneurial behavior (Iakovleva *et al.*, 2011).

To summarise, academics agreed that the acquisition of transversal competencies and basic entrepreneurial skills would create positive environments aimed at promoting entrepreneurship in Europe and define entrepreneurship as a transversal competence aimed which could help at increasing employability (Iglesias-Sánchez *et al.*, 2019; Laguna-Sánchez *et al.*, 2020)

Summarizing the sub-chapter, the author has defined the following factors have affected the development of business education in recent years: 1) HEIs collaboration with businesses, policymakers, and students in curriculum design has a positive effect on the outcome of educational programs in business schools; 2) Competency-oriented approach in curricula design mitigates the discrepancy between CLDI and domestic students as well as increases the employability of graduates and prepares them for lifelong learning; 3) Use of IT enables the application of new teaching methods and fosters the development of online education as well as enhances the availability of training in business disciplines worldwide, promoting education and lifelong learning; 4) Ethics, social responsibility, and principles of responsible management that stimulate a critical view at the leadership and the approach for teaching raise many challenges for educators in terms of the course design and student-oriented teaching methods. In sum, the modern trends in business education implementation are aimed at the students’ competences transformation and development the contemporary competence for managers and entrepreneurs.

It is possible to form an opinion that the previous statements in sub-chapter 1.2. that HEI providing business education is a complex system, connecting with multiple elements, activities, relationships, and different groups of interests, is confirmed again. The author arrives as a conclusion that there is a claim for continuous development of the organization; hence a holistic, systemic view of HEIs to comprehend the system is required to evolve the holistic approach for the stakeholders’ management, their interests advancements, and operational decisions making.

The next sub-chapter outlines the research of the competences expected from the ones who lead and manage modern organizations. The part includes a qualitative content analysis of the interpretations of the demanded competences and a cluster analysis of their relationships.

## 1.4 Contemporary Competences for Managers and Entrepreneurs

Managerial professional competences are directly related to the external environment, as the essence of a manager's job is to supervise an organization's activities, as is defined in the Merriam-Webster dictionary, while the Oxford dictionary describes a manager's role more precisely defining it as a "person responsible for controlling or administering an organization or group of staff"; therefore, it is hardly possible to act as a manager without interaction with the external environment. Hereafter, managerial competences are subject to change in responding to challenges around the globe: economic downturns, technological innovations, globalization, and internationalization of economies as well as changes in the role of SMEs (Derwik *et al.*, 2016; Guðmundsson, 2012; Lapiņa & Aramina, 2011; Urošević & Grahova, 2014). Nowadays, managers must lead teams that are diversified in terms of locations, disciplines, and societies (Guðmundsson, 2012; Wiek *et al.*, 2011; Silvius, 2016; Derwik *et al.*, 2016; Urošević & Grahova, 2014) and are required to make the diversity among various cultures and social groups easier (Wiek *et al.*, 2011; Silvius, 2016). Hereafter it is interesting to recognize whether there are differences or adjustments in professional competences that need to demonstrate by a manager today contrary to the ones that are believed to be acceptable norms for the profession.

Technological novelties invented within the last decades are characterized by a tremendously fast diffusion of innovations; its pace rate is equal to five years nowadays which is ten times less than it was 150 years ago (Grath, 2013). Acceleration of technological adoption is one of the core elements of the fourth industrial revolution development, and as a result, it is logical to assume that the changes required modern managers to develop new abilities and skills to respond to external environmental challenges. Previous researchers (Barbato, 2015; Oosthuisen, 2017; Akhtar, 2017) have already pointed out that role of the manager who operates in the context of the fourth industrial revolution or industry 4.0 differs from a manager who had to manage enterprises before. It was already defined by researchers (Oosthuisen, 2017) that the person should act as an entrepreneur, manager, and leader simultaneously, who controls the organization, inspire the technologically advanced team and act as an innovation catalyst. The challenges are caused by the difference between the concepts of governance, organization, and leadership as essentially different types of activities. It might be concluded that the importance of self-identification in a role of a manager or entrepreneur defines a set of practices to apply and will differ because entrepreneurial practices are different from engineering and managerial practices: as enterprise life cycle management, operations management, financial management and control, the architecture of an enterprise, organizational changes, and leadership.

Conducting a literature review, it was identified that managers operating within the 4IR era should combine skills and competences to act efficiently in different roles – entrepreneur, leader, and manager. It is required to demonstrate inspirational leadership and create a new organizational form in the framework of a digital organization staffed with technically skilled people. It is assumed that he can establish a trusting relationship with all stakeholders and create an open environment for creativity, new ideas generation, and decentralized decisions making. Apart from it industry 4.0 defines (Marr, 2016) a new requirement for information transparency

and as a result, it demands genuine integrity of the new leaders. Hence, it was observed the following was observed:

Manager's operational decisions are data-driven, i.e., she should be

IT-savvy, familiar with the latest digital technologies because his technical skills are required to drive the organization forward with an automated business decision, facilitate dialogue with the team, which became more tech skilled than in the age of 3rd industrial revolution or earlier, and create new organizational form due to increased machine intelligence.

Capable to reveal analytical skills and quantitative techniques to operate with big data findings and analytical insights.

Requirements for transferrable social skills are higher than decades ago (Kuokkanen *et al.*, 2013) and a manager's core soft skills sets include the listed abilities:

Emotional intelligence and transferrable social skills, especially ability for collaboration, openness to novelties, and aptness to encourage dialogue with different stakeholders.

Potential for lifelong learning (LLL) to develop new competences continuously and be ready for visibility, appraised to the professional community.

In knowledge society abilities and skills of knowledge, workers become a source of competitive advantage for the organization and shape the human capital of the enterprise that is the subject for acquisition externally through selective recruitment or internal selection and development. For instance, researchers (Baron *et al.*, 1996) suggested recruiting knowledge workers in accordance with a) their specific skills and abilities to perform tasks to reach short-term objectives, b) their potential for knowledge creation capacity and network ties to meet long-term goals, and finally, c) their cultural fit to meet long-term goals. Other researchers developed the idea and emphasized the importance of the exchange of information, knowledge, skills, and training for the key stakeholders in the organization (Au-Yong *et al.*, 2017). It is implied that managers are the ones who oversee the creation of an environment that is favorable for knowledge management (KM) nourishing culture in the organization. They should develop and apply strategies to balance meeting short-term and long-term objectives; therefore competitive potential and future skills development are the areas for their consideration. Researchers (Wright *et al.*, 2001) pointed out the shift in strategy development paradigm towards knowledge-based competition, innovation, and change where competencies, knowledge creation, its transfer, and integration foster the organization's uniqueness, competitive advantage, and organization's agility. The findings echoed the idea about the organization's dynamic capabilities (Teece *et al.*, 1997) which are defined as abilities for integration, building, and re-mastering competencies to face challenges of the rapidly changing environment.

Considering the concept of continuous integration, building, and reconfiguration of competencies as well as the necessity for managers' competencies development to address knowledge creation capacity the authors were curious about the possible ways for acquiring the competencies that eventually shape the set of integrated managers' competences, which facilitate a holistic approach for knowledge intensive business service (KIBS) organization management and enhance KM thinking. The development of knowledge intensive business

services in recent decades can be interpreted as one of the signals of transformation from an industrial economy into a knowledge-based one. The widely spread knowledge intensive services are seen as a core sector in the modern knowledge economy and understanding this as a system of consumption and production that is based on intellectual capital that is in its turn is elicited from the skills and knowledge of the actors. Hence, it is possible to state that the knowledge economy system relying upon new intellectual skills and their development both in traditional enterprises, where KIBS activities are integrated into operational and business activities, and in the new set up KIBS ventures where value chains are heavily dependent on the competences of their founders and employees. Digital transformation and knowledge intensive services influenced the essence of entrepreneurship and became as one of the pillars of entrepreneurial society where any inhabitant can promote and deliver a value to their customers via digital platforms unless they have necessary skills.

Researchers (Zyl, 2015) mentioned that skills development requires both formal education and practice, as the combination helps to ameliorate weaknesses. Observations or observational learning also might act as a source of new knowledge as people learn from others (Bembenutty *et al.*, 2015). Some competence development has been influenced by the professional institutions that train and certify member practitioners or establish standards that impact academic programs (Crawford *et al.*, 2006, Thomas & Mengel, 2008). At the same time, some authors pointed out the importance of so-called ‘given’ skills and abilities (Verboncu & Condurache, 2015) while other numerous studies (Baron & Parker, 2000; Berson *et al.*, 2006) show the significance of emotional and social qualities as the main competences related to excellent performance. According to Nikic *et al.*, 90% of competences necessary for managers’ success are emotional and social in their nature (Nikic *et al.*, 2014). Exploring a variety of channels how competences might be obtained, literature review and content analysis were selected to proceed with text interpretations, 12 sources were selected; the main criteria for selection were relevance to management challenges in knowledge-intensive industries (e.g. IT, financial technologies, architecture, medicine, consulting, etc.) and multicultural environments, where multiculturalism was assessed as intersection or example of interdisciplinary teams, cross-national teams, virtual teams or different social groups.

Following the methodology proposed by Mayring for qualitative content analysis, 16 elements of managerial skills, abilities, and competences were identified (Mayring, 2000). The description of these components is listed in Table 1 in Appendix below; these elements the author organized in three groups to conclude the weight of each of the groups:

1) Elements which are based and developed on personality traits (e.g., leadership, ethics, emotional intelligence, achievement orientation, and adaptability); this is the biggest group in the selection – 24% of the sources cover the elements from the group.

2) Elements which are related to a person’s education (e.g., technical competence, culture awareness, business orientation, strategic and analytic thinking); 35% of sources discussed competences that are gained because of formal training or education.

3) Elements which are acquired because of experience (teamwork, communication, negotiation, conflict management, advisory, and coordinating skills); 41% of the explored sources discussed the importance of training on the job and experience-based competences.

A visual representation of the results is presented in Fig. 1.4 below.

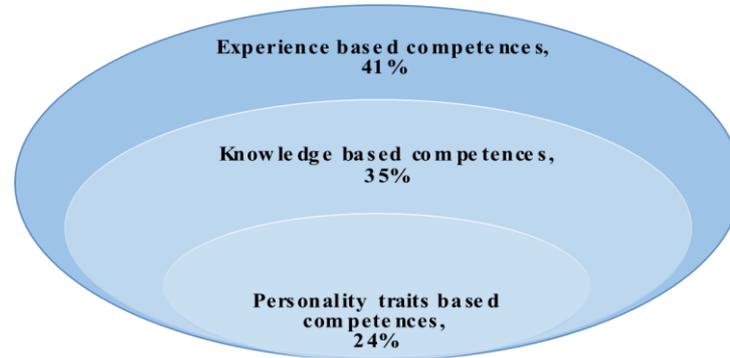


Fig. 1.4 Components (elements) grouped by source of acquisition (created by author)

In 1993 Spencer and Spencer (Spencer & Spencer, 1993) developed a competency model where they defined the ability to influence, orientation to achievement, strong analytical thinking, and the ability for teamwork and cooperation as the crucial competences for a manager. Later researchers declared that business domain knowledge (Mathews, 2007; Chen & Wu, 2011), commercial orientation for delivery value driven products (Cikmačs, 2012; Mathews, 2007) and external customer focus (Mathews, 2007), as well as crisis management and strategic planning (Ekimci & Ozkan, 2009; Cikmačs, 2012) competences are identified as demanded by knowledge-intensive organizations nowadays. However, the literature review reveals that the vast majority of researchers believe that the soft skills of modern administrators cannot be underestimated as help them to address issues of diversity (Wiek *et al.*, 2011; Silvius, 2016), negotiate with stakeholders (Derwik *et al.*, 2016) as well as conflict management (Ingason & Jónasson, 2009).

The literature overview reveals that cross-cultural teams' diversity varies in terms of different groups that might be defined as followed: 1) Interdisciplinary teams; 2) Cross-national teams; 3) Virtual teams; 4) Different social groups.

Hereafter, a manager should be familiar with different cultures, respect differences, and be open to various cultures, social skills and interpersonal competences should be adjusted in the first place: 1) Communication competences; 2) Collaboration and teamwork abilities; 3) Leadership competences.

Apart from the stated earlier extrinsic and intrinsic factors that make influence and shape different sets of competences due to the variety in the maturity level of the organization, its culture, and goals, as well as the manager's personal characteristics, including emotional intelligence and intellectual flexibility were revealed. Hence, changing environment facilitate the importance of change in interpersonal skills and especially communication competences of a modern manager who should administer and control multicultural teams that might be simultaneously varied in terms of nationalities, locations, knowledge domains, and social groups. Hereafter, to enhance teamwork, cooperation, and collaboration within the group, a manager must demonstrate adaptability to new work processes and teams, sensitivity to diversity among the stakeholders and actively embracing it, adjust his leadership modus operandi, and demonstrate openness to different cultures.

It is worth mentioning challenges which managers face in the context of communication do not limit only to internal stakeholders, in the era of client-centric organizations, social media, and corporate conscience, the managers act as a communication bridge with 3rd parties, hence should be aware multicultural landscape within the organization and all around.

Knowledge-based economy change landscape of the modern enterprises, non-profit organizations, educational institutions, and government establishments. Affected by globalization, technology development, increasing role of ICT, and market demand workforce became more skilled than decades ago. The increasing role of information and knowledge guides the growth in the number of modern organizations around the world, and, consequently in the number of knowledge-rich jobs. It is important to equip people with proper skills to secure their employability in the knowledge society, and world leaders, such as the International Labour Office (2011) or the European Commission (2004) addressed the importance of the headline in their educational and labor development policies. Hereafter, the interest of scholars in the topic is up-to-date and responds to growing interest in the evolution of knowledge intensive modern enterprises and more valuable skilled labor. OECD acknowledged new extra “workplace competencies” that are required for the labor force in the knowledge economy, and managerial occupations are the ones where changes in skills and abilities are expected even more than in other fields as the flat structured organizations, self-organized teams as virtual working groups and sustainability challenges are the actual context where managers must evaluate risks and make operational and strategic decisions (OECD, 2001).

### ***Methodology of Research***

A literature overview of secondary sources was conducted to analyze managers’ competence groups and a manager’s role in modern enterprise and clarify what competences are required for managers in knowledge-intensive business service organizations and identify whether the ten leading competencies are necessary for a manager in modern organizations. The author also analyzed articles published in EBSCO host database by researchers who explored competencies for managers operating in the field of the knowledge economy and managing IT, banking and finance, insurance business, service management, and other present-time organizations from 2003 to 2021, see the list of the selected sources in Table 2 in Appendix. The articles were selected according to the frequency of their citation. Author applied the following keywords to select the scientific literature: *competence, knowledge management, manager, managerial competence*. After the critical analysis the author selected academic and periodical sources as well as reports of official authorities for the further content analysis, 40 items in total, where the share of each of the source is distributed as 87%, 8%, and 5% accordingly, the process of going through 4 systematic literature review steps is shown below (Fig. 1.5). As per recommendations for qualitative content analysis developed by P. Mayring (2014), three segmentation rules or units of analysis have to be defined. The first one is the ‘coding unit’, or the smallest component of material within one category: the study of a specific word or phrase. The second one is the ‘context unit’, which defines the largest component in the category, a document page in the case. Finally, the third one, is the ‘recording

unit' that "determines which text portions are confronted with one system of categories", is an article or document.

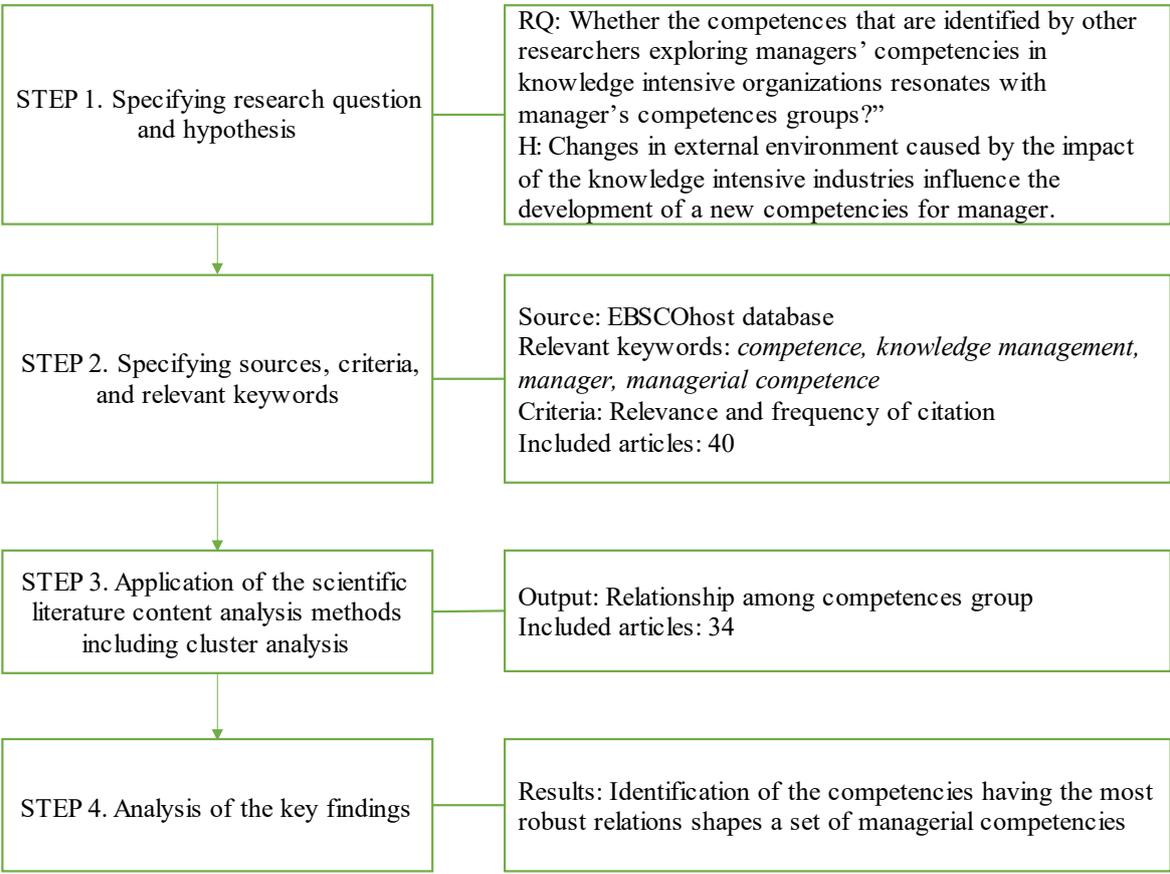


Fig. 1.5 Content analysis process diagram (created by author)

The competences of managers are analyzed by applying Managers' competence groups developed by Lapiņa *et al.* (2015). The essence of the grouping is a distribution of all managerial competencies into four groups Professional, Personal and responsibility, leadership competencies, then Social and communication competencies, and Innovative and Learning competencies, see Table 1.3.

Table 1.3

Manager's competence groups developed by Lapiņa et al. (2015)

Competence groups	Competencies
Professional competencies	Ability to analyse and evaluate Ability to plan Ability to manage Ability to motivate Ability to react, delegate, and divide risks Ability to present

<b>Competence groups</b>	<b>Competencies</b>
Personal and responsibility, leadership competences	Leadership Self-organisation and self-development Responsibility Collaboration Erudition Respect Trustworthiness, loyalty Intelligence Intuition Self-criticism (reasonable)
Social and communication competencies	Ability to form relationships within the company Ability to form relationship outside the company Ability to persuade and motivate Ability to form and organize teamwork Ability to compromise, diplomacy Ability to communicate in a foreign language
Innovative and learning competencies	Ability to create (creativity) Ability to spot and cease opportunities Ability to generate ideas Ability to take risk Willingness to learn Ability to promote employee development Ability to pass on knowledge and skills Ability to notice illogical issues

The following research hypothesis was developed by the author: “Changes in external environment caused by the impact of the knowledge intensive industries influence the development of a new competencies for manager”. The main research question was followed: “Whether the skills and abilities that are identified by other researchers exploring managerial competencies in modern knowledge intensive organizations resonate with the competencies that are defined above?”

The author applied scientific literature content analysis to answer the main question of the research. To perform the analysis Nvivo for Mac version 11.4.3 (2084) was applied for coding while Nvivo 11 for Windows version 11.4.1064 (64 bit) was used for cluster analysis.

Text coding in the content analysis is considered as the first step, hence competences groups as four main nodes while competencies for each of the competence groups have been defined as sub-nodes, that are six sub-nodes for Professional competencies, ten for Personal competencies, another six for social and communication competencies, and eight sub-nodes for Innovative and Learning competencies. The next step is the content analysis and calculations of indicators. Jaccard’s coefficient (0 = least similar, 1 = most similar) was applied to identify a similarity between competences groups and the competencies themselves. Visual

representation of the cluster analysis demonstrates the nodes that have been coded similarly are clustered together on the diagram while the nodes that have been coded differently are displayed further apart.

**Results and Findings**

The author identified a strong relationship between competences groups where dominates correlation of Social and Personal competences groups, 0.94, as well as a relationship between Professional and Innovative competence groups, 0.77, which is proved by the analysis result (see Table 1.4).

Table 1.4

The relationship among competences group, created by author

Node A	Node B	Jaccard's coefficient
Nodes\\Idea_Lapina_Model \\SOCIAL	Nodes\\Idea_Lapina_Model \\PERSONAL	0.9429
Nodes\\Idea_Lapina_Model \\PROFESSIONAL	Nodes\\Idea_Lapina_Model \\INNOVATIVE	0.7714
Nodes\\Idea_Lapina_Model \\PERSONAL	Nodes\\Idea_Lapina_Model \\INNOVATIVE	0.7368
Nodes\\Idea_Lapina_Model \\SOCIAL	Nodes\\Idea_Lapina_Model \\INNOVATIVE	0.7368
Nodes\\Idea_Lapina_Model \\PROFESSIONAL	Nodes\\Idea_Lapina_Model \\PERSONAL	0.7297
Nodes\\Idea_Lapina_Model \\SOCIAL	Nodes\\Idea_Lapina_Model \\PROFESSIONAL	0.6842

The cluster analysis presented in Fig. 1.6 demonstrates a visual representation of the similarity observed earlier.



Fig. 1.6 Cluster analysis results of the central nodes

The author compared the recognized frequency of coded sub-nodes within the researched sources to identify the most frequently mentioned and discussed competences to continue with data exploration. It was discovered that among Professional competencies for managers, the ability to Analyze and Evaluate is the most repeated (Fig. 1.7).

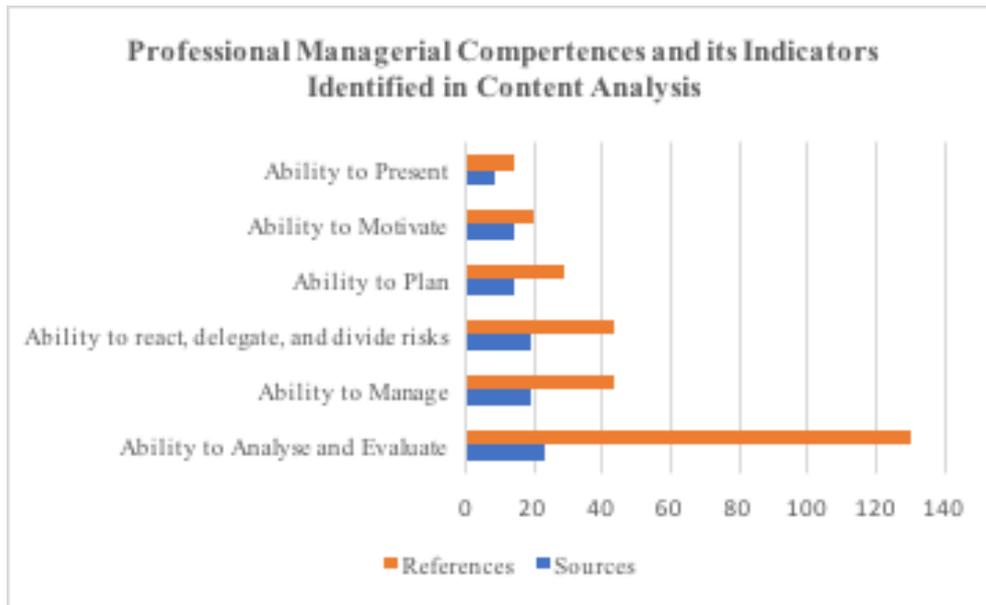


Fig. 1.7 Managerial competences and their indicators identified in content analysis, created by the author

It is essential to mention that the competence is a leader not only in its competence group but also in the whole range of the competences reviewed in the research context).

Reviewing Personal and responsibility leadership competencies data, the author observed that Leadership competence is dominated over the rest of the group (see Fig. 1.8).

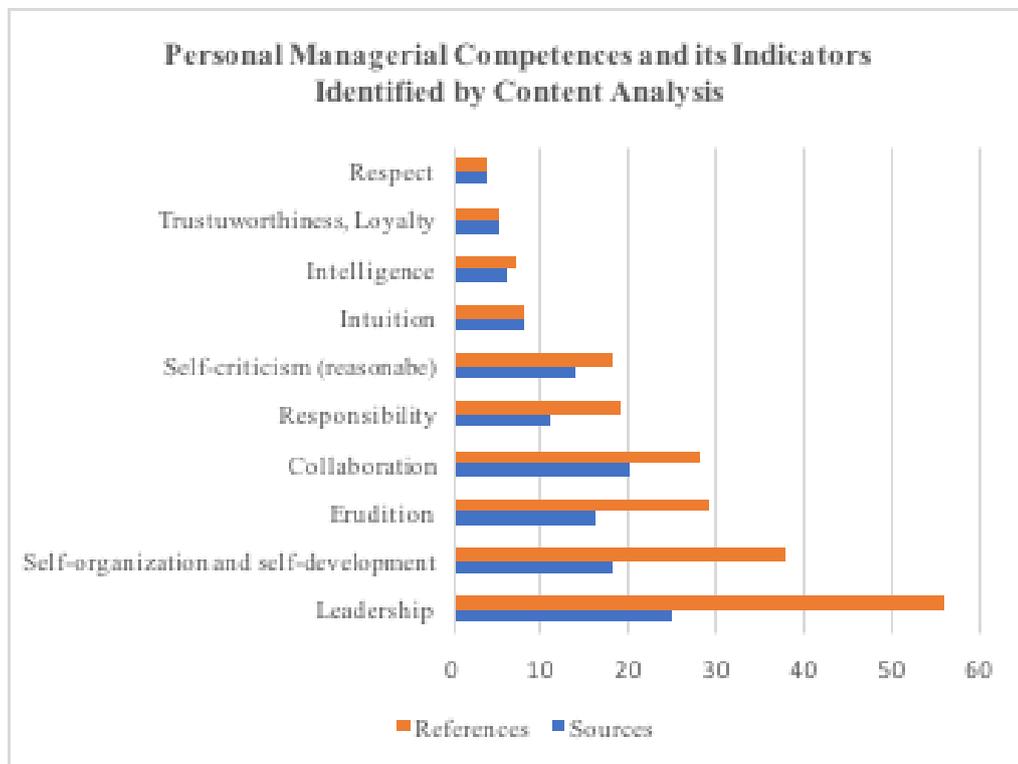


Fig. 1.8 Personal competencies for managers and their indicators identified by content analysis (created by author)

The analysis of coded nodes for the third group of competences discovered that among Social and communication competences Ability to form relationships outside own organization is the most frequently discussed by other researchers (see Fig. 1.9).

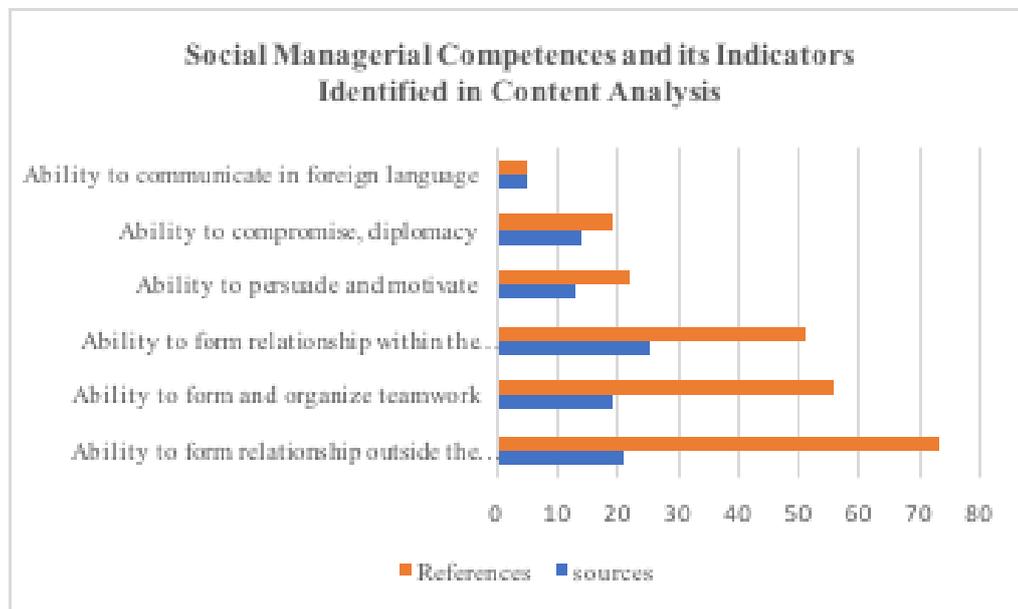


Fig. 1.9 Social competencies for managers and their indicators identified in content analysis (created by author)

As per the fourth group of Innovative and learning competencies, it was disclosed that the most intensively researched and described is a Willingness to learn competence (see Fig. 1.10) which is the second most discussable competence after the Ability to analyze and evaluate the entire list of competencies.

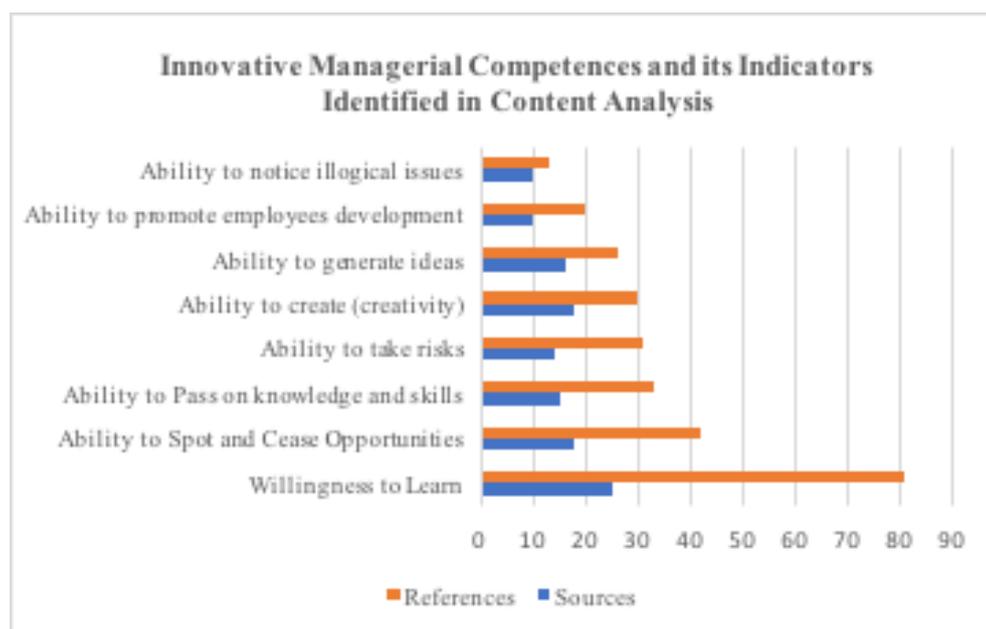


Fig. 1.10 Innovative competencies for managers and their indicators identified in content analysis

The third step in the investigation was the application of the techniques described in the first step of the analysis to identify the relationship between competencies and construct a cluster analysis diagram of the sub-nodes (see Fig. 1.11 below).

For the research, it was decided to inspect competencies where Jaccard's coefficient is the highest one that is varied from 0.65 to 0.50 (see an example of the similarity analysis in Table 3 in Appendix and discover how these competences are linked with the ones that have been identified as the most dominated in their competence groups. The findings of the part are described in detail in the forthcoming paragraphs.

It was observed that the ability to analyze and evaluate has a well-built correlation to the competencies in all four competence groups as follows: a) Ability to react, delegate, and divide risks (Professional group), 0.62, b) Ability to form relationships in the organization, 0.6 and outside the organization, 0.57 (both from Social group), c) Collaboration competence (Personal group), 0.59, and d) Ability to create (creativity) (Innovative group), 0.58. Interestingly, the slightest similarity is the ability to analyze and evaluate, demonstrated to Intuition competence, 0.24, from the Personal group. It is evident to the author to observe that inside its competence group, the ability to analyze and evaluate holds a relationship with the Ability to delegate, 0.62, and the ability to plan, 0.62; however, the ability to motivate and the Ability to present hold feeble relations with the primary competence, 0.22 in both cases. As per the author, the finding might be explained by the increasing role of collaboration and new forms of relationships among team members in self-organized teams and flat structured organizations that form contemporary enterprises' landscape (Denford & Chan, 2011; Guðmundsson, 2012; El-Sofany *et al.*, 2014; Sedighi *et al.* 2017).

Leadership competence from the Personal and responsibility group was addressed by other researchers more often than others debating about competences for managers; that is why it is important to note that the strongest relationship was observed between Leadership and the ability to form relationships inside the organization, 0.61, and the Ability to organize teamwork (both from Social group), 0.57. Unexpectedly to the author, the ability to communicate in foreign languages (Social group), the Ability to promote employee development, and the ability to pass on knowledge and skills (both from the Innovative group) demonstrated a very weak relationship to Leadership skills, which constituted 0.15, 0.21, and 0.21 accordingly. It is worth mentioning that inside the Personal group, the following competencies besides the Leadership demonstrate a strong link: a) Erudition and Collaboration, 0.64, b) Self-organization and Self-development with Collaboration, 0.58, and c) Self-organization and Self-development and Self-organization with Erudition, 0.55. Later the author will discuss that the competences also have a strong correlation with the Willingness to learn, which is a part of the Innovative group. Hence, it might be interpreted as a demand for personal competences oriented toward a new knowledge acquisition and creation, which seems quite logical for modern organizations.

As it was mentioned above, a central competence for discussions in a Social group is a manager's ability to form relationships outside the company; hence, the author was not astonished when recognized that the strongest relationship the competence has with the competence that is very close by all skills and expertise – to another competence from Social group, the ability to form relationship inside the company, 0.64. It should be noted that it also

has a relationship with the ability to create or creativity (Innovative group), 0.63, and Ability to Analyse and Evaluate (Professional group), 0.57, which might be explained by the Open Innovation theory and other researchers that emphasize the importance of reciprocal knowledge exchange between external stakeholders for a purpose to create a new product (European Commission, 2012; Bettiol *et al.*, 2016; Sarka & Ipsen., 2017; Zieba *et al.*, 2017). The authors discovered that the competence is characterized by an unexpectedly weak relationship to a seemingly vital competence, such Social group’s competence as the ability to communicate in foreign languages, 0.23. The ability to compromise and diplomacy (Social group) also has a relatively low relationship with the primary competence, 0.40.

Finally, analyzing interdependencies between Willingness to learn, an essential for researchers' discourse in Innovative and learning competencies group, the author realized that the tightest relationships the competence possesses with the following set: a) Collaboration, 0.61, b) Self-organization and self-development (both from Personal group), 0.59, c) Ability to form relationship outside and inside the company (Social group), 0.59 and 0.56, and d) Erudition (Personal group), 0.58.

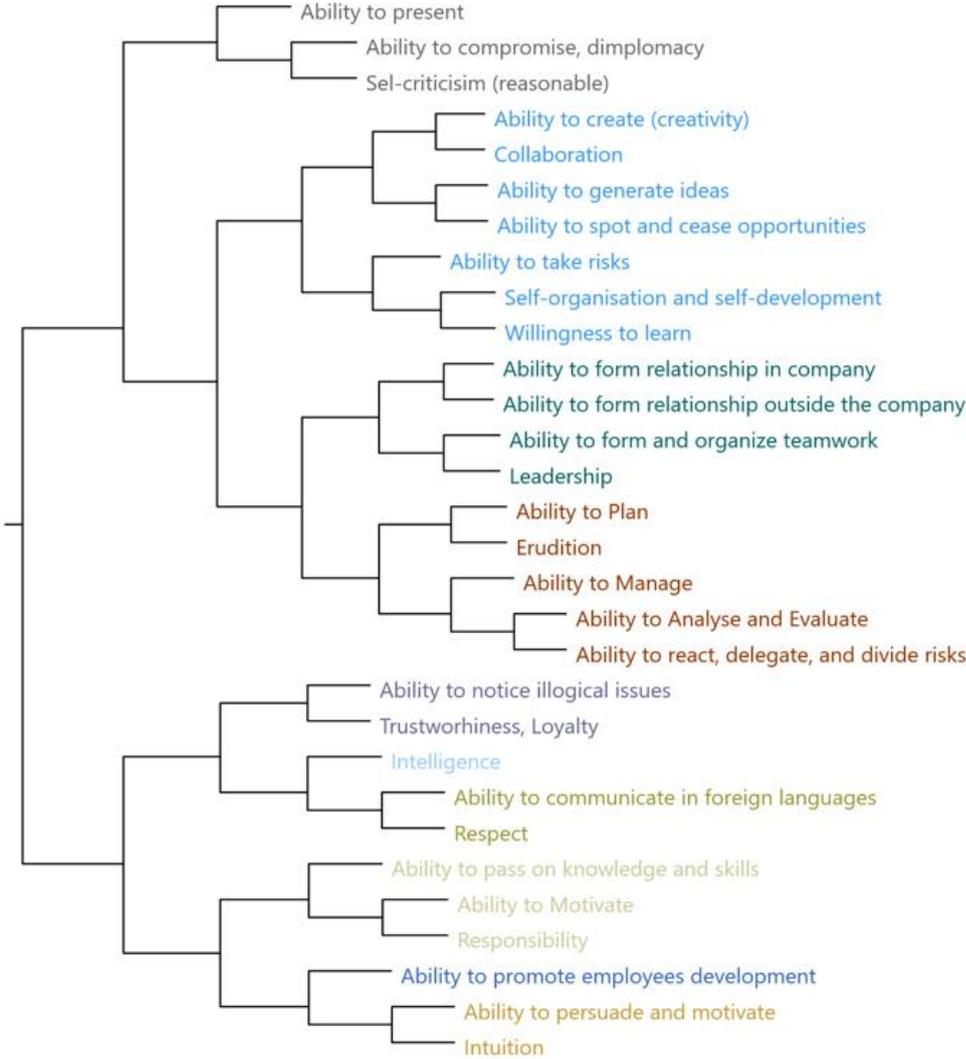


Fig. 1.11 Cluster analysis diagram of competencies for managers

The author also discovered that internally its own Innovative and learning competencies group, Willingness to learn, has a relationship with Creativity, 0.54, and Ability to spot and seize opportunities, 0.54. The findings are vital, as they lead the author to conclude that innovative and learning abilities for managers in the up to date organizations are not based only on an individual's curiosity but also on self-discipline and collaboration with external and internal stakeholders. The author's attention was also attracted by observing weak relationships between Willingness to learn and Personal Intelligence, 0.19, Ability to communicate in foreign languages (Social group), 0.20, and Intuition (Personal group), 0.22. As the similar findings have been done earlier by the author in the context of explorations of the competencies of Professional groups, then it led them to a conclusion that due to globalization and multiculturalization of modern organizations, the ability to speak foreign languages is considered a natural, and hereafter is not assumed as curious for research and discussion. Similarly, the importance of Intuition competence is blurred because of management decision-making based on system thinking, facilitated IT and computing technologies, and big data.

The content analysis demonstrated two groups of competencies for managers that are most related to each other. This is a pair of Personal and responsibility, leadership competencies, and a group of Social and communication competencies (see Fig. 1.12).



Fig. 1.12 Relation of Personal and Social competence groups for managers

Another pair is a set of professional competencies and a group of Innovative and learning competencies (see Fig. 1.13).



Fig. 1.13 Relations of Professional and Innovative competence groups

Consequently, the author analyzed the concept of Managers' competence groups and the role of the Professional, Personal, Social, and Communication, as well as Innovative and Learning competencies in modern enterprises and clarified the significance of the competencies for a manager in the environment.

The author has analyzed 34 articles by different researchers to identify how Manager's competence groups developed by Lapiņa *et al.* in 2015 will resonate with the manager's competence to operate in the forward-looking organizations. It was discovered that

- Researchers tend to pair Personal and Social groups of competences and separately the Professional and Innovative groups;
- In the Social and Communication group, the Ability to form relationships inside the organization has a solid linkage for key competence in each of the competence groups, which are Leadership, the Ability to build a relationship outside the organization, the Ability to analyze and evaluate, and the Willingness to learn;
- In the Professional group, the Ability to analyze and assess is the most researched and frequently discussed by other researchers and has a stable correlation to each of the competence groups;
- Willingness to learn is the critical competence from the Innovative and Learning group possesses a sustainable linkage to the Personal and Social competence group;
- The competences that have strong connections with key competences in each group overlap between the groups.

Hereafter, the author concluded that in the context of modern organizations the following abilities and key competencies having the most robust relations shapes a set of managerial competencies:

1. Ability to analyze and evaluate;
2. Ability to react, delegate, and divide risks;

3. Ability to form relationships inside and outside of the organization;
4. Collaboration;
5. Ability to create (creativity);
6. Willingness to learn;
7. Self-organization and self-development;
8. Erudition;
9. Teamwork;
10. Leadership.

As these items belong to the different competencies groups, the findings support the hypothesis that the modern organizations influence the development of the managerial competence requiring a harmoniously developed personality whose abilities and competencies are progressed in multiple dimensions: 1) Innovative and learning competencies, 2) Personal, communication competencies, and leadership, and 3) Professional competencies. Taking this into account the author draws a conclusion about a request to grow in the future leaders such elements of managerial competence as innovativeness, proactiveness, and risk-taking.

### **Conclusions**

1. The chapter explores the nature of the business education, the involved stakeholders, and the latest trends in business education implementation by examining the scientific literature and conducting the content analysis. The author concluded that since 18<sup>th</sup> century, business education became more sophisticated and differentiated in terms of programs and geographical locations as business education reflects the significant changes in the external environment; educational programs in business administration and management remain the most demanding in HEIs in EU-27 within the last decade.
2. A HEI providing business education is a complex system, connecting with multiple elements, activities, relationships, and different groups of interests. The system includes active influencers, such as regulatory bodies, quality associations, and ranking organizations as well as enablers or stakeholders groups communicating their requirements to business education and are affected by activities of business education HEIs. Both active influencers and enablers impact the institution and are subject to monitoring and control.
3. The major modern trends in business education implementation are as follows: 1) Increasing importance of university and business cooperation; 2) Significance of curriculum adjustment; 3) Flexible teaching methods; 4) Growing role of competence-based education; 5) Increased importance of the stakeholders management.
4. The trends are aimed to develop contemporary competences for managers and entrepreneurs. Entrepreneurship is considered a transversal competence subject to integration into the educational process to shape the students' entrepreneurial behavior and orientation.

5. The future leaders who are in charge of a modern organization's management are personalities whose abilities and competencies are progressed in multiple dimensions: 1) Innovative and learning competencies, 2) Personal, communication competencies, and leadership, and 3) Professional competencies. In sum, this is a request to grow such elements of managerial competence as innovativeness, proactiveness, and risk-taking.

Chapter 2, "Entrepreneurial Orientation and Competence Development," investigates the professional competencies required in the labor market, assessing their importance, which can promote answering Research question 2.

## **2 ENTREPRENEURIAL ORIENTATION AND COMPETENCE DEVELOPMENT**

As was already stated in the previous chapter, competences that are developed and trained in business education HEIs are subject to changes due to number of reasons. The main trends having impact on the content of business education are globalization and the changing role of SMEs, followed by increased number of diversified virtual and cross-cultural teams, and necessity for the ones who lead a business endeavor to act as manager and entrepreneur simultaneously. Growing role of competence-based education and demand to embed entrepreneurship as a transversal competence into educational program is the other reflections in HEIs caused by changes in the external environment. External stakeholders clearly articulate their interest in entrepreneurship training and enhancement of the students' entrepreneurial orientation at HEI as it is important for small and micro-enterprises and assumed as a predictor for a new ventures set-ups leading towards business success. Increasing importance of university and business cooperation and understanding of the external stakeholders management support the HEI curriculum adjustment aiming to provide students and employers with educational service meeting their expectations.

The EU definition of entrepreneurship includes the concepts of skills, knowledge, and attitude. The last one cannot be developed without the complementary behavioral and motivational components, which are assumed as triggers playing a pivotal role in developing the entrepreneurial behavior (Oganisjana, 2010). From this perspective, entrepreneurial orientation represents an important construct linking the individuum, his motivation, interest, skills, behavior, and reaction to the labour market calls, and, consequently, stakeholders expected that HEIs provide students not only with formal training in entrepreneurship but also with real life problem solving, entrepreneurial experience, let them to make their own first mistakes and reflect on it.

Hereafter, the aims of the second chapter is to explore academic literature, opinions of entrepreneurs and educational institutions to identify whether the entrepreneurial competence is developed sufficiently in HEIs and recognize the level of the entrepreneurial orientation of the students. The second chapter describes the research for entrepreneurial orientation demand by stakeholders; the first phase was conducted in Finland, Latvia, and the Netherlands, and the second phase in Bulgaria, Latvia, Lithuania, Poland, and Ukraine.

### **2.1 Entrepreneurial competences and managerial competences**

Understanding of entrepreneurial competence is started through comprehension the dichotomy of the managerial and entrepreneurial competences and HEIs undertakes for their development. Students and employers are the clients of business education HEIs, who are interested in the result-oriented educational services provided by the organizations. These stakeholders might not make difference between the competences as they are interested in the

output – the ability to lead modern organizations, however, from the educators' perspective the topic is more thoughtful as might be related to the content of the educational programs and as a result to the output of the educational services.

### 2.1.1 Competences Research Theoretical Background

Although there are different opinions among researchers about the overlapping of managerial and entrepreneurial competences, over the last decades a noticeable increase in the number of small and medium enterprises (SMEs) where managers perform entrepreneurial, managerial and operational functions simultaneously was observed (Cohen & Musson, 2000; Man, 2001; Nikitina & Lapiņa, 2019). There are researchers who assume that entrepreneurs are more skilled than managers due to their interchanging roles as managers, owners, and entrepreneurs. Researchers have identified a specific group of competences that are required to start and manage small businesses while responding to its specific challenges (Huck & McEwen, 1991; Smith & Morse, 2005; Gaile-Sarkane, 2012) which corresponds to another discovery explaining that the earliest life cycle stage of business endeavour requires a different set of abilities in comparison with later stages (Roša & Lāce, 2016). More and more researchers today are interested in exploring the field of development of entrepreneurial knowledge, skills set and competencies that are required for the successful launch and management of a firm. Mitchelmore and Rowley (Mitchelmore & Rowley, 2010) propose a list including 50 skills, business, entrepreneurial, and management, also human relations, conceptual and relationship skills as well as attitude or features skills. Lans *et al.* (Lans *et al.*, 2015) describe the following five generic competencies: opportunity competence, social competence, business competence, industry-specific competence, and self-efficacy. Addressing sustainability issues Dentoni *et al.* have developed a framework consisting of seven competencies: systems-thinking competency, foresight-thinking competency, normative competency, embracing diversity and interdisciplinary, interpersonal competency, action competency, and strategic management (Dentoni *et al.*, 2012). For the purpose of the study, it is noteworthy that competence (plural – competences) is understood as a sum of skills, knowledge and attitude, while competency (plural – competencies) includes also personal intent or behavior, hereafter competence groups contain numerous competencies – individual skills and abilities (Caune et al, 2014).

The number of companies that belong to the segment of small and medium enterprises is rising over the globe, and academia is concerned about proper formal and informal education methods to train and assess the competences adapted to the real business environment. For example, in the EU, SME companies are 93% of all registered enterprises (Eurostat, 2020) while in Russia the figure is even greater and is equal to 95.5% (Zavyalov *et al.*, 2017), it is 97% in China and even 99.8% in Lithuania (Korsakiene & Diskiene, 2015). The same high numbers in the countries participated in the research: 99.1% in Finland (OECD, 2022), 99.8% in Latvia (LR Central Statistical Bureau, 2020), and 99.4% in the Netherlands (Dutch Committee for Entrepreneurship, 2021). There were more than 22.6 million SMEs in the EU-27 in 2021, the biggest part are the enterprises where less than nine people are employed, supplemented with 1.3 million small enterprises between 10 and 49 employees following 201 thousand of the firms were number of employees varied from 50 to 249. In 2021 small and

medium firms in the EU employed approximately 84 million people and contributed about 3.5 trillion euros to the EU economy in 2020, hence the European Commission considers SMEs and entrepreneurship as key to ensuring economic growth, innovation, employment, and social integration in the EU (Statista, 2021)

Researchers are convinced that curricular and extracurricular activities focused on providing the necessary knowledge to start a business, including legal instructions for an entrepreneurial venture (Gordon & Bursuc, 2018), developing competency to spot and exploit a business opportunity, as well as increasing awareness and motivation in HEIs, form favourable conditions and culture to develop entrepreneurship intentions in students, influence self-efficacy and social norms (Fayolle & Gailly, 2013). It is worth mentioning that a one-year course is not the sole option that HEIs could offer to students, short three- or four-days workshops and summer school programs became popular extracurricular activities in European HEIs (Aaboen, 2020). There is another promising direction in education activities: it is the emphasis on entrepreneurial activities for students in technical discipline programs by means of creating an interdisciplinary course on the basics of entrepreneurial skills covering economic, managerial, and social science aspects of a problem and its subsequent pilot implementation. The outcome of the approach is the expectation that students will be aware of the business environment and will be able to apply the skills in practice (Hrehova & Gluchman, 2015). However, despite the benefits of the cross-disciplinary approach, its application has not become standard yet (Husremovic *et al.*, 2017). Researchers have found a positive correlation between entrepreneurial competence development and digital skills used for learning and new knowledge creation while business simulations remain among the efficient tools for developing critical thinking and a deeper understanding of the essence of entrepreneurship. In more sophisticated cases the young generation demands in-depth development of entrepreneurial marketing skills for students who work and study within the entrepreneurial teams, e.g. a marketing model application in a small or medium enterprise or the creation of a business plan is a highly-rated activity empowering students' entrepreneurial competence in the context of higher education entrepreneurial teams (Isaila, 2015; Chalupsky *et al.*, 2016; Hrehova & Ilecko, 2016; Petrylaite, 2018; Ferreras-Garcia *et. Al.*, 2019). Exploring the entrepreneurial competences the author (Nikitina & Lapiņa, 2019) analyzed the relationship between managerial and entrepreneurial competences and identified that managers and entrepreneurs partially share the same set of competencies, and the importance of the competencies varies for each of the groups.

Concluding the theoretical part, it should be noted that many research efforts have been spent to define and classify distinct features of the entrepreneurship phenomenon during the early steps of a business endeavor, but there is no unified understanding has been achieved so far. There are differences in the perception and description of start-ups among academics, investors, government and regulative institutions, business support institutions and businesspeople. Hence it was required to fill the gap in the knowledge about entrepreneurial competence taught (performed) by HEIs and graduates' competence demanded (considered as necessary) by the market for promptly participation in a new value creation.

### 2.1.2 Competences Research Methodology

The aim of the study was to analyze the correlation between the actual market demand for competences to launch and develop new businesses until the point of hypothetical equilibrium, between control and changeability in the entity, and competence training in higher education institutions and business supporting institutions. The main research question was: Are the entrepreneurial competences demanded by the domestic markets in Finland, Latvia, and the Netherlands aligned with the entrepreneurship educational and business supporting policies? The geographical scope justification of the European countries is the following: Latvia represents a small emerging economy in the region while the Netherlands and Finland are the examples of the developed economies, the Dutch economy is considered as one of the largest in the world (Georank, n.d.). Justification of the sample for the research was predefined by a project scope as the studies were performed as part of the ERASMUS+ KA2 Strategic partnership project “European Entrepreneurship Training Community”, where the Entrepreneurship Competence Framework “EntreComp” was chosen as a benchmark for the assessment of emerging and demanded skills in the labor market. Framework “EntreComp” was chosen as a benchmark for assessing emerging and demanded skills in the labor market (Bacigalupo *et al.*, 2016). EntreComp is an entrepreneurial competence model developed in response to ‘A New Skills Agenda for Europe: Working together to strengthen the European Commission's human capital, employability, and competitiveness. It describes entrepreneurship as a transversal competence that citizens can apply to all spheres of life, from nurturing personal development to actively participating in society, for (re)entering the job market as an employee or as a self-employed person, and to starting up ventures (cultural, social or commercial). The framework is made up of three competence areas: ‘Ideas and opportunities’, ‘Resources’ and ‘Into action’. Each area includes five competences, which together are the building blocks of entrepreneurship as a competence. The complete list of competences might be found in the Table 4 in Appendix.

To answer the research question the interview sessions were conducted in three European countries – Finland, Latvia, and the Netherlands. The focus group method was applied as the major method for the first phase of the research to determine the demanded competences for start-ups. The focus group method was chosen for its highly interactive and dynamic character. The diversity of opinions present in a focus group leads to a more creative and productive discussion. Carson *et al.* (2001) indicate that “focus groups concentrate clearly on a specific topic and involve interactive discussion among its participants.” The focus group was composed of start-up entrepreneurs. Entrepreneurs were carefully selected based on their entrepreneurial growth experience and involvement in the national entrepreneurship ecosystem of the country. They were also associated with a business supporting institution, i.e., a business incubator or accelerator, they collaborated with a higher education institution that is a partner of the project, and had launched at least two successful business enterprises. The focus group activity was carried out in three corresponding steps: 1) Brainstorming to generate entrepreneurship competences that are necessary at the early stage of business concept development until the “Go-Go” stage of the Adizes Corporate Lifecycle model (Adizes, 2004); 2) Identifying which of the generated competences are listed in the EntreComp model and which are new, and 3)

Evaluating the importance of the existing 15 EntreComp competences and newly identified competences. The Adizes Corporate Lifecycle model was used to provide a comprehensive reference to the events during the lifecycle of a business entity. Companies at the “Go-Go” stage have gained recognition, demand for their product and/or service, and sound cash flow. The stage continues the establishment period, “Courtship”, and initial operating period, “Infancy”. The later stages of the model was out of scope for the research as each of the Adizes Corporate Lifecycle stages requires a different set of entrepreneurial competences that are built on a set of fundamental and theoretic skills and knowledge, however, the focus of the study was limited to the first three initial stages of the model.

Five Finnish entrepreneurs took part in the focus group sessions in April of 2019, the entrepreneurs had a high intercultural profile – sharing Finnish and other nations’ backgrounds and actively involved in the Kymenlaakso region's entrepreneurship development. Individual interviews were organized with four entrepreneurs in the Netherlands in April 2019. Due to the various availability of the respondents, the focus group activity was substituted by interview sessions; each session lasted one hour. The fields represented by the entrepreneurs were consulting, food production, medical skincare, and production of disinfecting solutions. Six entrepreneurs in Latvia took part in the focus group activity in February 2019; it lasted for 1.5 hours. Three of the respondents commercialize their products internationally; the rest operate locally. The entrepreneurs represented manufacturing, business consulting, IT, and interior design.

The evaluation of the importance of entrepreneurship competences was derived from the focus group activity and resulted in the first half of the importance-performance analysis (IPA). IPA is a methodological approach that is defined for evaluating the effectiveness of the entrepreneurship training methodology in higher education institutions in three project countries—Finland, Latvia and the Netherlands—and in turn to compare these results with those that are gained through the research. During the next phase of the research the semi-structured interviewing of representatives of HEIs and BSIs was applied for the collection and processing of information. The aim of interviewing higher education institution representatives, including study program management and academic staff and entrepreneurship supporting institutions, was to measure the performance levels of training the previously identified entrepreneurship competences.

All the activities described above were summarized in a comprehensive Importance-Performance Analysis (IPA) to investigate the relationship between the importance of the competences required by the market and the quality, or performance, of the competences that are developed by higher education and business support institutions. The author applied the IPA method to analyze and visually represent inputs from both respondent groups: entrepreneurs and institutions that train students for entrepreneurship – HEIs and BSIs. IPA is a technique that visualizes four quadrants based on the values of importance and performance of different elements, which are calculated concerning each other on a two-dimensional coordinate system. Based on the instruction given by the authors of the method, the values of different attributes are provided by respondents’ assessment. They are calculated and represented in the coordinate system where the horizontal axis is considered as performance, and the vertical axis – is

importance (Martilla & James, 1977; Līce *et al.*, 2017). Importance and performance ratings are displayed on a two-dimensional grid and fall into one of four quadrants — “Keep up the good work,” “Potential overkill,” “Low priority,” and “Concentrate here.” Conducting focus groups formed from start-up entrepreneurs, the authors asked the respondents in each country to evaluate the competences listed in the EntreComp Framework on a scale from 1 to 4, where 1 is the least essential competence that is necessary to start a business activity. The same grid was applied in the second phase when the authors asked BSIs and HEIs to evaluate the performance level of the EntreComp competences that are developed through their training activities in the institutions. The traditional visualization of IPA results in the form of quadrants and allows the researchers to assess both performance and importance of the competences, where the “Concentrate here” (High Importance / Low Performance) quadrant presents the most significant discrepancy between importance and performance and hereafter translates disparity in expectations of the market players and education and business supporting institutions; “Keep up the good work” (High Importance / High Performance) section covers the competences that are trained sufficiently and fully satisfy the market needs, “Low priority” (Low Importance / Low Performance) part of the IPA quadrant represents the competences that are considered as not important by the market players, and “Possible Overkill” (Low Importance / High Performance) section contains the competences that are properly trained by HEIs and BSIs but are not demanded by the market. Overall, the IPA method was used to assess entrepreneurs’ perceptions about the importance and performance of competence development by educational and business supporting institutions in the countries.

### **2.1.3 Competences Research Results**

The respondents from Finland evaluated the importance of the EntreComp competences; as the most demanded competences (top 3 with highest weighted rank) were 1) Motivation and perseverance, 2-3-4) Creativity; 2-3-4) Spotting Opportunities; 2-3-4) Learning through experience. Still, the least demanded competences (top 3 with lowest weighted rank) were 1-2) Financial and economic literacy (12), (1-2) Ethical and sustainable thinking (12); 3) Mobilizing others (13).

Dutch entrepreneurs evaluated as the most demanded competences (top 3 with highest weighted rank): 1) Motivation and perseverance, 2-3) Spotting opportunities, 2-3) Vision. Motivation and perseverance were complemented by passion and ambition which were additionally listed and highly valued by the respondents. Spotting opportunities was related to the ability to continually learn and acquire information, understand when the time could be right for a business idea, and the ability to solve a problem in the form of entrepreneurship. The Vision was important in terms of long-term strategy, decision making, and maintaining a focus.

In accordance with the data gathered from the Latvian entrepreneurs’ sample, the most demanded competences (top 3 with highest weighted rank) were: 1) Coping with uncertainty, ambiguity, and risk, 2-3) Motivation and perseverance, 2-3) Planning and Management. The least demanded competences (top 3 with lowest weighted rank) were: 1) Ethical and sustainable thinking, 2) Financial and economic literacy, 3) Creativity. The questioned stability of the financial system in the country and its ability to support growth in the economy as well as other

negative internal factors such as strained labor market, decline in population, and slower than expected external growth might be defined as a root cause of the highest ranking for the competence of coping with risks and uncertainty (Emerging Europe, 2020). Interestingly that both Latvian entrepreneurs pointed out Ethical and Sustainable Thinking as well as Financial and Economic literacy competences as the least important. One competence was separately distinguished from the EntreComp list – Activating the market – the ability to be able to create demand for the product, to be knowledgeable about the market, and use this knowledge for the benefit of the start-up, it can also include disruptions in the market.

Answers from three HEIs and four of the six BSIs in Finland were analyzed to gain an overview of the competence performance levels in their organizations. Each representative evaluated the competences on a scale of 1 (the least performed) to 4 (highly performed) and could also reply non-applicable where the competence is not performed at all in the institution. The results were weighted based on the number of times it gained evaluation on a scale from one to four. The least trained competences are: 1) Activating the market, 2-3-4) Mobilizing others, 2-3-4) Financial and economic literacy, 2-3-4) Ethical and Sustainable thinking. The most trained competences are: 1) Working with others, 2) Spotting opportunities, 3-4-5-6) Creativity, 3-4-5-6) Self-awareness and self-efficacy, 3-4-5-6) Motivation and perseverance, 3-4-5-6) Planning and Management, and 3-4-5-6) Learning through Experience.

In the Netherlands were interviewed three institutions. The most performed or trained competences (top 3 with highest weighted rank) were 1) Taking the initiative, 2-3) Working with others, and 2-3) Motivation and perseverance. The least performed or trained competences (top 3 with lowest weighted rank) were 1) Ethical and sustainable thinking 2) Financial and economic literacy 3) Planning and Management.

For the purpose of the research in Latvia were conducted interviews with respondents from HEIs and BSIs. The respondents were three higher education institution representatives whose competence covers the execution of entrepreneurship training curricula within the study program, a course, or extracurricular activity, especially regarded as best practice of this institution. To extend the research and understand entrepreneurship training within the entrepreneurship ecosystem, the researchers also conducted five interviews with entrepreneurship supporting organizations, for instance, business incubators, accelerators, and one co-working space; eleven institutions in total were interviewed. The least trained competences: 1) self-awareness and self-efficacy, 2) coping with uncertainty, ambiguity, and risk, and 3) financial and economical literacy. The most trained competences: 1-2) learning through experience, 1-2) valuing ideas, 3) spotting opportunities.

It is worth mentioning that Latvian entrepreneurs' opinions are not aligned with the educational and supporting activities of the domestic HEIs and BSIs. For example, competence for Coping with uncertainty, ambiguity, and risk, which is ranked as highly important by businesspeople, is ranked as least performed by HEIs and BSIs, while the other competences, considered by start-ups focus group as important (Motivation and Perseverance as well as Planning and Management,) were not elected by educational institutions or incubators as highly important for training. However, it is also worth noting that Latvian entrepreneurship training

activities are aligned with Finnish programs, as such competences as Spotting Opportunities and Learning through Experience were considered as most trained in both countries.

In conformity with the IPA method in Finland, such competences as Self-awareness and Self-efficacy as well as Coping with Uncertainty, Ambiguity and Risk were displayed in “Concentrate Here” section, this might be interpreted as an instruction for HEIs and BSIs in Finland to draw attention to the competences training due to discrepancy in evaluations. Educational and supporting activities aimed to develop abilities for Working with Others and Taking the Initiative might become lower in intensity as their positioning in the “Possible Overkill” quadrant communicates about lack of direct benefit from the activities due to the low importance of the competence for the Finnish market. There are no new findings for the research in the “Keep Up the Good Work” and “Low Priority” quadrants, as these recommendations go in line with the previously mentioned findings. The IPA chart based on data gathered in Finland in 2019 can be found in Fig. 2.1.

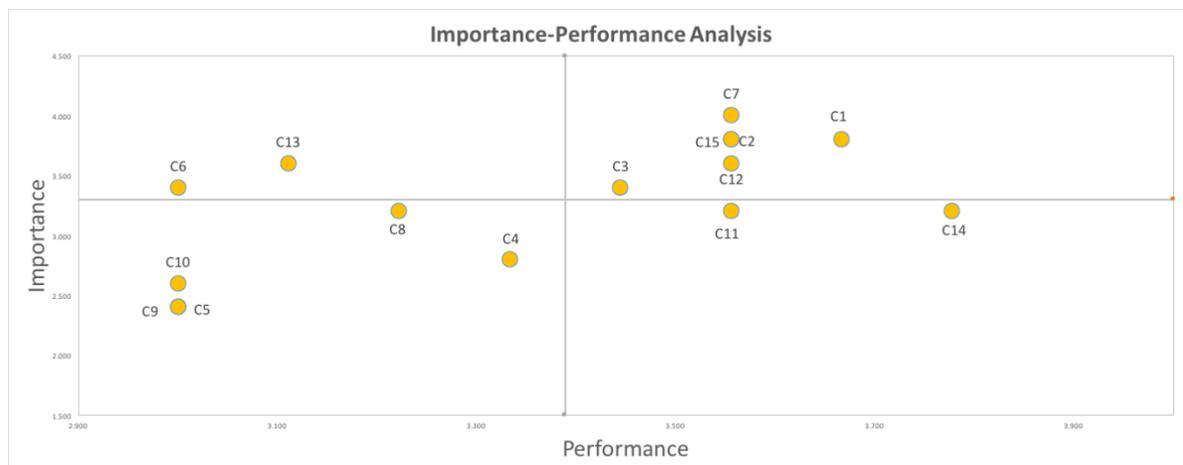


Fig. 2.1 IPA chart based on data gathered in Finland, 2019 (created by author)

*Note:* C1 – Spotting Opportunities, C2 – Creativity, C3 – Vision, C4 – Valuing Ideas, C5 – Ethical and Sustainable Thinking, C6 – Self-awareness and Self-efficacy, C7 – Motivation and Perseverance, C8 – Mobilizing Resources, C9 – Financial and Economical literacy, C10 – Mobilizing Others, C11 – Taking the Initiative, C12 – Planning and Management, C13 – Coping with Uncertainty, Ambiguity, and Risk, C14 – Working with Others, and C15 – Learning Through Experience.

In accordance with the IPA chart created on the data gathered by the researchers in the Netherlands (see Fig. 2.2), HEIs and BSIs in the country could draw their attention to the role of the competences such as Creativity, Vision, Self-awareness and Self-efficacy as well as Mobilizing Resources, in the educational and support programs. Location of the competences in “Concentrate Here” quadrant represents high importance of the skills for entrepreneurs but low performance in the competence training by institutions, hence the area might be additionally developed.

In the same time, efforts for training and supporting such competences as Valuing ideas, Coping with Uncertainty, Ambiguity and Risk, as well as Working with Others might be smaller

in their size. There are no major findings regarding the location of the competences in the “Low Priority” and “Keep Up the Good Work” quadrants, as the findings are coherent with the previously mentioned observations. Probably due to the relevant small respondents sample in the Netherlands the method does not allow comments on the positioning of Mobilizing Others on the chart.

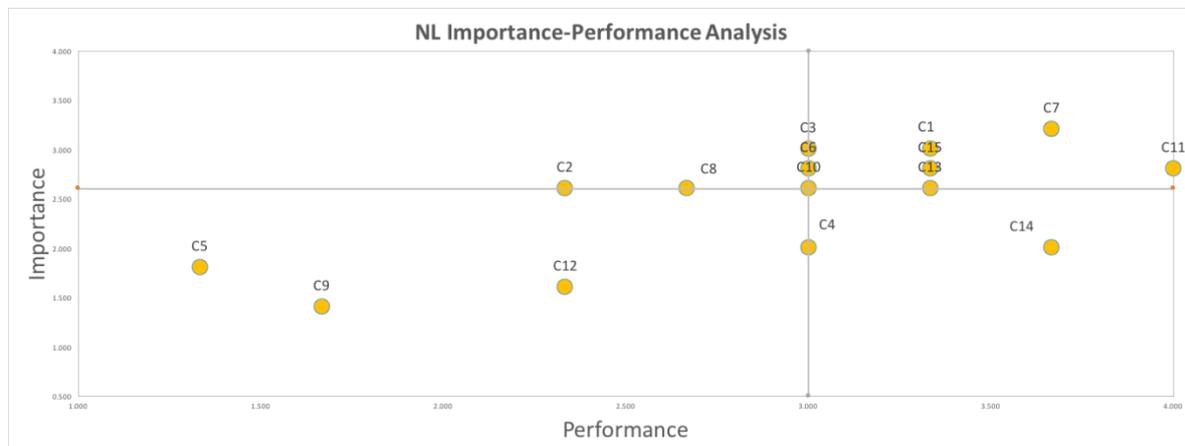


Fig. 2.2 IPA chart based on data gathered in the Netherlands, 2019 (created by author)

*Note.* C1 – Spotting Opportunities, C2 – Creativity, C3 – Vision, C4 – Valuing Ideas, C5 – Ethical and Sustainable Thinking, C6 – Self-awareness and Self-efficacy, C7 – Motivation and Perseverance, C8 – Mobilizing Resources, C9 – Financial and Economical literacy, C10 – Mobilizing Others, C11 – Taking the Initiative, C12 – Planning and Management, C13 – Coping with Uncertainty, Ambiguity, and Risk, C14 – Working with Others, and C15 – Learning Through Experience.

In Latvia the IPA analysis results confirm the findings observed in the previous steps of the research, Motivation, and Perseverance as well as Coping with Uncertainty, Ambiguity, and Risk competences, previously identified as highly important for business endeavors, these are positioned in “Concentrate Here” quadrant. Additionally, the quadrant contains Activating Market (or Marketing) competence that was identified by Latvian start-up entrepreneurs during a brainstorming session and assessed as important for a business start. Allocation of Spotting opportunities, Creativity, Vision, and Valuing Ideas competences in the “Possible Overkill” quadrant verifies the above statement about the disagreement between Latvian HEIs and BSIs educational programs and the domestic market needs – these competences were not evaluated by entrepreneurs as highly important however these abilities are considered as the most trained in the institutions. As for the competences exhibited in other quadrants – there is no disagreement with previous findings, see the IPA graph created on the data collected in Latvia in the year 2019 in Fig. 2.3. It is worth mentioning that the collected data is not sufficient for interpretation of the Mobilizing Resources competence positioning on the IPA chart, as it is at the point where the X-axis crosses the Y-axis. Hence additional data or another method needs to be applied for further analysis. Although Creativity competence is positioned on the vertical

axis, the authors believe it might be interpreted as positioning in the “Possible Overkill” section due to the previously made observations.

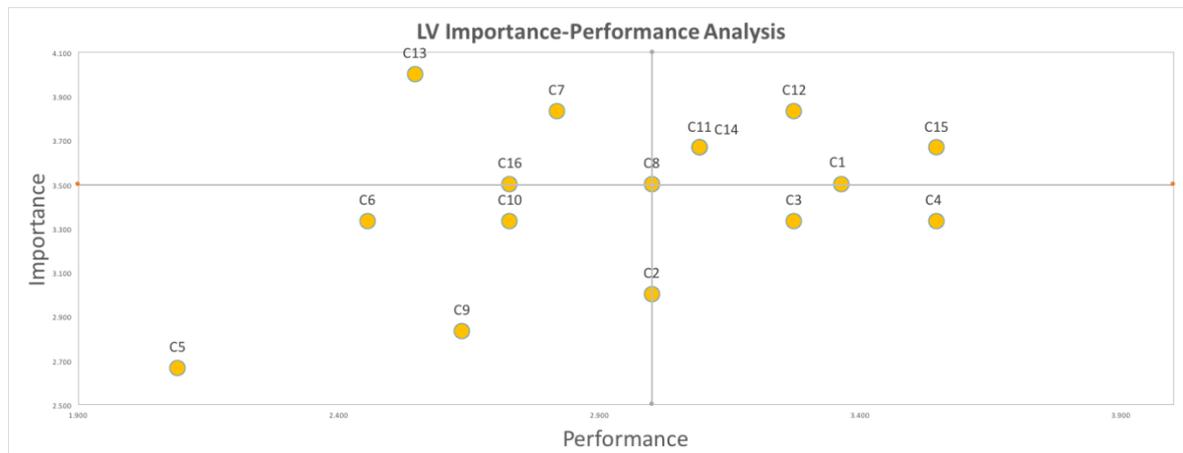


Fig. 2.3 IPA chart based on data gathered in Latvia, 2019 (created by author)

*Note.* C1 – Spotting Opportunities, C2 – Creativity, C3 – Vision, C4 – Valuing Ideas, C5 – Ethical and Sustainable Thinking, C6 – Self-awareness and Self-efficacy, C7 – Motivation and Perseverance, C8 – Mobilizing Resources, C9 – Financial and Economical literacy, C10 – Mobilizing Others, C11 – Taking the Initiative, C12 – Planning and Management, C13 – Coping with Uncertainty, Ambiguity, and Risk, C14 – Working with Others, C15 – Learning Through Experience, and C16 – Activating Market.

The main conclusions are follows, upon studying the information about the training methods of entrepreneurial competences and their development, in comparison to the actual market demand, the author concluded that there are many variances as well as similarities in entrepreneurial competence distribution among the IPA quadrants of High Importance/Low Performance (“Concentrate Here”), High Importance/High Performance (“Keep Up the Good Work”), Low Importance/Low Performance (“Low Priority”), and Low Importance/High Performance (“Possible Overkill”). The observation leads to an understanding that the entrepreneurial education needs to be more harmonized with the expectations of the labour market. The main limitations of the study – 1) its focus is on the competence assessment performed in Finland, Latvia, and the Netherlands; 2) the sample size of the respondents; 3) business start-up focused respondents that do not concentrate on high growth, hereafter the observations could not be generalized for all of Europe and beyond.

Nevertheless the findings are very important for understanding what are the competences that are demanded by the labour market and are expected to be trained in HEIs the most. The data and theory triangulation were performed, and its output is presented in the Table 2.1, Table 2.2, and Table 2.3. This tables represent digest of the literature analysis findings and judgments of the representatives of business, HEIs, and BSIs related to the most demanded competence and its demonstration by the students. The tables contain two columns: the first column represents the output of the literature analysis; the second column encapsulates the most demanded competences (top 3 with the highest weighted rank) in accordance with the

respondents' evaluation. In sum this outlines how the findings of literature analysis and beliefs of the industry representatives are integrated with the behavioral manifestation of the competences.

The approach of combining both theoretical and empirical research discovers that to conform to the market needs and forefront of future employability student demonstrates the following behavior.

***Manifestation of proactive behavior is demonstrated as an individual's preference to plan and take the initiative for the future or act in anticipation of future demand***

The proactive and responsible behavior in planning and taking initiatives for the future or acting in anticipation of future demand that might be defined as proactivity, supporting facts both from the literature and interviews are presented at the Table 2.1.

Table 2.1

Theory and Data Triangulation: The Most Demanded Competences and its Manifestation  
(created by author)

Literature analysis findings	Interviews with entrepreneurs, HEIs, and BSIs
<ul style="list-style-type: none"> <li>• The need to remain calm under pressure becomes more important. (Oosthuizen, 2017)</li> <li>• Researchers developed a framework consisting of seven competencies including foresight-thinking competence and action competence (Dentoni et al, 2012)</li> </ul>	Market (LV, FI, NL) HEI (FI, NL): <b>Motivation and perseverance</b> are understood as determination to turn ideas into action and being resilient under pressure and temporary failures.
<ul style="list-style-type: none"> <li>• Universities and business schools offer courses to teach students how to identify opportunities, estimate the resources required, and acquire them to start up a new business (Gielnik and Oyugi, 2015).</li> <li>• Five generic competencies were described including opportunity competence, business competence, and industry-specific competence, (Lans et al, 2014).</li> </ul>	Market (FI, NL) HEI (LV, FI): <b>Spotting opportunities</b> , described as identification of needs to be met, identification and seizing opportunities for value creation
<ul style="list-style-type: none"> <li>• Local authorities outline their requirements for responsibilities, qualifications, knowledge, skills, and competences for every profession; their emphasize importance of planning and strategic management as core competence for organization managers (Latvian Republic profession standards, 2020).</li> <li>• Leadership and management skills were valued higher than others as the primary employee skill in</li> </ul>	Market (LV) HEI (FI): <b>Planning and Management</b> , e.g., setting short-, medium-, long-term goals and define actions plan to reach them.

Literature analysis findings	Interviews with entrepreneurs, HEIs, and BSIs
<p>accordance with the OECD Top 10 skills for future jobs (Vincent-Lancrin, 2016).</p> <ul style="list-style-type: none"> <li>• Researchers proposed a list of 50 key competences including business and management skills, such as development of the management system necessary for the long-term functioning of the organisation or development of procedures (Mitchelmore and Rowley, 2010)</li> </ul>	
<ul style="list-style-type: none"> <li>• Among the most demanded transversal skills are indicated communication and teamwork skills (CEDEFOP, 2022)</li> <li>• Knowledge-intensive modern organization require extensive collaboration and new forms of relationships among team members in their self-organized teams and the flat structures (Denford, 2011; Guðmundsson, 2012; El-Sofany, 2014; Sedighi <i>et al.</i> 2017).</li> <li>• Managers today address issues of diversity (Wiek <i>et al.</i>, 2011; Silvius, 2016), negotiate with stakeholders (Derwik <i>et al.</i>, 2016), and resolve conflicts (Ingason &amp; Jónasson, 2009).</li> </ul>	<p>HEI (FI, NL): <b>Working with others</b>, that is cooperation with other for ideas development and implementation, as well as networking and conflicts resolution.</p>
<ul style="list-style-type: none"> <li>• The creation of a business plan is a highly-rated activity empowering students' entrepreneurial competence (Ferrerias-Garcia, 2019).</li> <li>• Intended learning outcome is a student's ability to develop and present a business plan or understanding the process of a new venture set-up (Pardede and Lyons, 2012).</li> </ul>	<p>Market (NL): <b>Vision</b>, that is visualization future plans, imagination the future, development a roadmap to turn ideas into actions plan</p>
<ul style="list-style-type: none"> <li>• Teaching methods foster students' creativity, systems thinking, proactive attitude, teamwork, and long-term thinking (Dimante et al, 2016).</li> </ul>	<p>HEI (NL): <b>Taking the initiatives</b>, assuming initiation processes that create value, independently activities and work to meet the goals.</p>
<ul style="list-style-type: none"> <li>• Five generic competencies were described including social competence and self-efficacy (Lans et al, 2015).</li> <li>• Development of entrepreneurship intentions in students, positively influence their self-efficacy (Fayolle and Gailly, 2013).</li> </ul>	<p>HEI (FI): <b>Self-awareness and self-efficacy</b>, described as assessment personal and group weaknesses and strengths as well as reflections on the needs and aspiration in short- and long-term perspective.</p>

***Manifestation of an ability of an individual to take bold actions, taking risks for obtaining high returns or venturing into the unknown.***

The ability to take bold actions, taking risks for obtaining high returns or venturing into the unknown that might be defined as risk-taking, supporting facts both from the literature and interviews are presented at the Table 2.2.

Table 2.2

Theory and Data Triangulation: The Most Demanded Competences and its Manifestation  
(created by author)

Literature analysis findings	Interviews with entrepreneurs, HEIs, and BSIs
<ul style="list-style-type: none"> <li>• Manager who leads enterprise today act as an innovation’s catalyst (Oosthuizen, 2017).</li> <li>• Expected outcome of educational activities - students aware of the business environment and can apply the skills in practice (Hrehova and Gluchman, 2015).</li> </ul>	<p>HEI (LV): <b>Valuing ideas</b> through recognition their potential for creating value and judge what value is in social and economic norms.</p>
<ul style="list-style-type: none"> <li>• Ability to cope with uncertainty are included in the list of job requirements for a manager (LR profession standards, 2020).</li> <li>• Crisis management competence is demanded in modern organizations (Ekimci &amp; Ozkan, 2009; Cikmačs, 2012)</li> <li>• Flexibility and overcoming difficulties competences were valued slightly higher than others in the OECD Top 10 skills for future jobs (Vincent-Lancrin, 2016).</li> </ul>	<p>Market (LV): <b>Coping with uncertainty, ambiguity, and risk</b> is understood as making decisions when the result is uncertain or coping with fast-moving situations swiftly and flexibly.</p>
<ul style="list-style-type: none"> <li>• Accreditation body measures students’ success ensuring their economic and financial literacy, and strong customer orientation (AACSB 2020 standards).</li> <li>• Young generation demands development of marketing skills for students who work and study within the entrepreneurial teams (Petrylaite, 2018).</li> <li>• Commercial orientation to deliver value driven products are expected from the ones who lead modern organizations (Cikmačs, 2012; Mathews, 2007).</li> </ul>	<p>Market (LV): <b>Activating market</b> that is understood as sales and marketing activities for idea’s commercialization.</p>

***Demonstration of a high degree of interest in trying new ways of doing things or solving problems and experimentation***

The high degree of interest in trying new ways of doing things or solving problems and experimentation that might be defined as innovativeness, supporting facts both from the literature and interviews are presented at the Table 2.3.

Table 2.3

Theory and Data Triangulation: The Most Demanded Competences and its Manifestation  
(created by author)

Literature analysis findings	Interviews with entrepreneurs, HEIs, and BSIs
<ul style="list-style-type: none"> <li>• Latvian national educational guidelines stress the importance of developing transversal competences, including creativity (OECD, 2020; LR Profession standards, 2020)</li> <li>• EU recommends enhancing creativity and innovation at all levels of education and training (EU, 2019).</li> <li>• Creative thinking and creativity exercises are required for business students to improve their ability to generate innovative ideas, shift from one idea to another, or change their perspective and come up with original solutions (Schlee and Harich, 2014).</li> </ul>	HEI (FI) Market (FI): <b>Creativity</b> , that is a development of idea for value creation, including better solutions for existing and new challenges through experimentation with innovative approaches.
<ul style="list-style-type: none"> <li>• Accreditation body measures students’ success ensuring their abilities in analytical thinking, learning from experience, ethical and sustainable thinking (AACSB 2020 standards).</li> </ul>	HEI (LV, FI) Market (FI): <b>Learning through experience</b> , that is learning both from success and failures, assuming any initiative for value creation as a learning opportunity.

Based on the analysis above the author made a conclusion that the core elements for development of entrepreneurial competence in the context of HEI are defined as proactiveness, risk-taking, and innovativeness.

The investigation of the professional competences required in the labor market was conducted in the scope of focus groups with entrepreneurs and the unstructured interviews with HEIs and BSIs representatives in Finland, Latvia, and the Netherlands. The entrepreneurs identified the competence demanded (considered as important) by the market while the representatives of the business education HEIs evaluated the level of how the competence was trained and developed within the educational programs. Importance-Performance Analysis (IPA) to investigate the relationship between the importance of the competences required by the market and the quality, or performance, of the competences that are developed by higher education and business support institutions.

It was disclosed that Motivation and perseverance, Spotting opportunities, Planning and Management, Working with others, Vision, Taking the initiatives, Self-awareness and self-efficacy, Valuing ideas, Coping with uncertainty and risk, Creativity and Activating the market are evaluated as the most demanded competences by the industry representatives. It was found that there are many variances as well as similarities in entrepreneurial competence distribution among the IPA quadrants that leads to understanding that the entrepreneurial education needs to be more harmonized with the expectations of the labour market. Additionally, the data and theory triangulation revealed the core elements for entrepreneurial competence development in the context of HEI, these elements are defined as proactiveness, risk-taking, and innovativeness. These allow to make the following conclusions about the scientific novelties of the research:

- According to the needs of HEI's stakeholders in three European countries, a level of entrepreneurial competences` importance has been explained, and HEI's performance in terms of its delivery has been evaluated. The different stakeholders' groups stressed the significance of the competence for employability.
- Competencies developed by business education and required and expected by the labor market are identified. It was disclosed that the core competences, including creativity, risk-taking, and proactiveness, are relevant for managers and entrepreneurs.

The following sub-chapter presents the analysis of scientific literature on individual entrepreneurial orientation (IEO) theories, IEO survey methodology, questionnaire design, and results of the research of the students' stakeholder group.

## **2.2 Individual Entrepreneurial Orientation (IEO)**

Nowadays, organizations have become more technologically sophisticated, they seek innovations to be competitive and sustainable in the market, however, the cornerstone of the organization's success is its human resource abilities and skills (Aparicio *et al.*, 2016). Educational bodies adjust their curricula to prepare graduates for challenges in the volatile environment where entrepreneurship skills have become more demanded over the last decades. The previous sub-chapter disclosed that proactiveness, risk-taking, and innovativeness and creativity as the core elements to be developed in an education institution. It is worth noting that in accordance with individual entrepreneurial orientation theories the elements are considered as a basis for IEO. The theories are explored below as well as the research methodology for the second phase of the research.

### **2.2.1 IEO Theory**

The entrepreneurial orientation (EO) framework was initially developed by Miller (1983), who introduced innovation, proactiveness, and risk-taking as measurable extents for entrepreneurship. Bird (1988, 2002) continued to declare that an individual becoming an entrepreneur demonstrates a particular entrepreneurial intention. In later studies, researchers concluded that understanding a person's intent toward entrepreneurship is crucial for increasing the number of entrepreneurs in the economy because the "entrepreneurs are made, not born" (Boulton & Turner, 2005).

In 2007 Kollmann *et al.* proposed a framework explaining individual entrepreneurial orientation and transferring EO construct to the individual level (Kollmann *et al.*, 2007). The researchers revealed the following factors having an impact on the entrepreneurial individuals acting in distinct countries: 1) individual striving for a high degree of autonomy in his life; 2) individual's attitude toward innovation determines entrepreneurial behavior; 3) propensity towards risk; 4) exploiting business opportunities; 5) competitive aggressiveness or 'need for achievement.'

The authors concluded that individuals are more likely to act entrepreneurially if they demonstrate a high aptitude for the dimensions. Apart from that, the authors emphasized the importance of social context for entrepreneurial capabilities and EO facilitating hence they named a hierarchy of cultural, political/legal, macro-economic, micro-economic layers as a precondition affecting the "individual nucleus from the outside to the inside" (Kollmann *et al.*, 2007). Later the idea was evolved by Bolton and Lane (2012), who introduced an individual-level entrepreneurial orientation (IEO) measurement instrument for entrepreneurial education or venture capitalists' decisions; the core elements of the method are innovativeness and creativity, risk-taking, and proactiveness, where

risk-taking is understood as the ability of an individual to bold actions, taking risks for obtaining high returns;

innovativeness and creativity as a high degree of interest in trying new ways of doing things or solving problems;

proactiveness is considered individual preferences to plan and take the initiative for the future or act in anticipation of future demand.

The researchers observe a correlation between the manifestation of the abilities and orientation towards entrepreneurial activities of the individuals.

Also many researchers have a common opinion considering that entrepreneurial education plays a significant role in entrepreneurial orientation formation - innovativeness and creativity, risk-taking, and proactiveness are correlated with IEO - these competences are considered the critical factors in the formation and development of the individual business activity (Bolton & Lane, 2012; Koe, 2016; Covin *et al.*, 2020; Santos *et al.*, 2020; Howard, 2020). Table 2.4 below contains a summary of other studies on IEO among students.

Table 2.4

A summary of the previous studies in the IEO field, created by author

<b>Author</b>	<b>Results</b>
Baughn <i>et al.</i> (2006)	Based on survey of business students in China, Vietnam, and the Philippines. Found that self-efficacy and close social support contributes to EO.
Bolton and Lane (2012)	Survey was conducted among university students. Found that innovativeness and creativity, risk-taking, and proactiveness are correlated with IEO.
Gelderen <i>et al.</i> (2008)	Examination of business students in the Netherlands. Found that entrepreneurial alertness was correlated with EI

<b>Author</b>	<b>Results</b>
Farashah (2013)	Entrepreneurial intentions of the students who had completed entrepreneurship course are higher in comparison with other individuals
Kollmann (2007)	Culture, politics/law, macro-economic and micro-economic factor influence on EO
Levenburg & Schwarz (2008)	Exploration of interests to entrepreneurship among Indian and American business undergraduates. Found that those with entrepreneurial intentions scored higher on creativeness not risk-taking.
Parnell <i>et al.</i> (2003)	Research was conducted in the USA and China. Found that Need for Achievement is a driver for entrepreneurial orientation, and this is different between student groups.
Sowmya <i>et al.</i> (2010)	Survey conducted among Business Studies students from Australia, Portugal, Finland, Germany, Slovenia, Poland, the UK, and the UAE. Found that entrepreneurial experience was associated with certain entrepreneurial attitudes.

The abovementioned has emphasized the topicality of the entrepreneurial orientation for HEI and the output of educational services, hence, to understand whether the expectations of students as stakeholders of business HEIs are met, a separate survey was organized. The part of research is seeking answer to the Research question 2 of the Thesis “What are the elements of Individual Entrepreneurial Orientation and its importance for contemporary competence development for managers by business education?”

The author of the Thesis explored entrepreneurship and entrepreneurial orientation theories to identify the most important elements to measure the business education students' individual entrepreneurial orientation (IEO) (research task 5) and compared the IEO Index values to explore the level of the IEO Index of students' groups in different European HEIs (research task 6). The conceptual model of this part of the research is presented on Fig. 2.4.

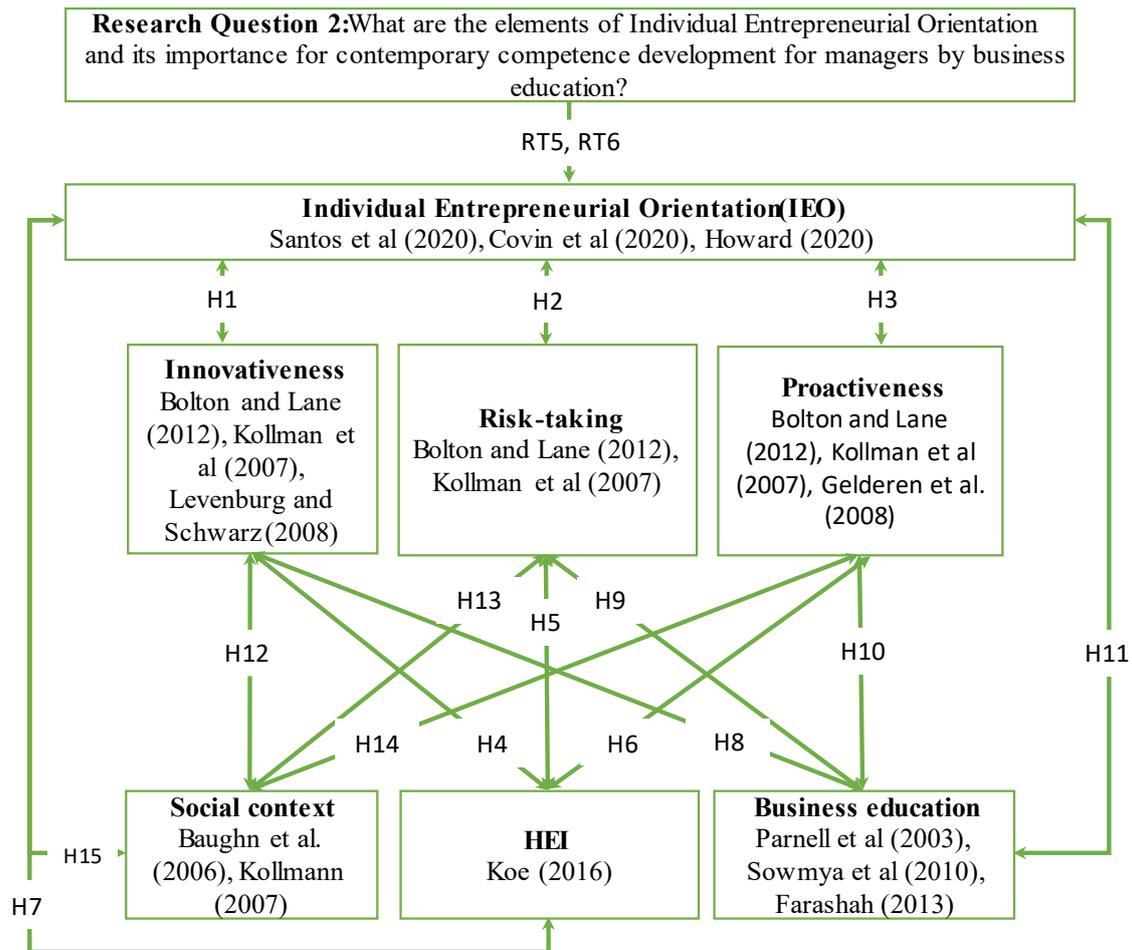


Fig. 2.4 Conceptual model of IEO study (developed by author)

Note: RT5 = research task 5, RT6 = research task 6, H1 to H15 = hypothesis of the study

The model was developed by taking into account the works of the other researchers; it was assumed that the students perception about their entrepreneurship abilities could be measured through prism of IEO formation and development during the studies in HEI. In accordance with the theories, Innovativeness and creativity (Bolton and Lane (2012), Kollmann et al (2007), Levenburg and Schwarz (2008)), Risk-taking (Bolton and Lane (2012), Kollmann et al (2007)), and Proactiveness (Bolton and Lane (2012), Kollmann et al (2007), Gelderen et al. (2008)) make impact on formation of the IEO (Santos et al (2020), Covin et al (2020), Howard (2020)) while the external factors such as education in the field of business and management (Parnell et al (2003), Sowmya et al (2010), Farashah (2013)), HEI (Koe (2016), and Social Context (Baughn et al. (2006), Kollmann (2007)) might serve as strong supporting factors for shaping IEO and its elements. Hence it is possible to stathe that the research addresses students' attitudes toward a potential entrepreneurial career across IEO and its measures. As an expected results might be defined the strong IEO score demonstrating the individual desires to run their own business act as entrepreneur, or the opposite – if the student is not interested in an entrepreneurial career, then her IEO will have a lower rank. It is noteworthy that

entrepreneurship was stated as the students' measure for examination due to prompt employability and preparation for the uncertain future through the learning experience and practical exercise that are the main interests of the stakeholders' group.

As was stated above, a few aspects are contributing toward IEO score measurement. The factors could be used as pillars to construct a composite IEO Index that is based on the following three components already proved by the other researchers: Proactiveness (or Exploiting opportunities), Propensity to risk-taking, and Creativity (Innovativeness or attitude towards Innovation). Hence the central question of the study (Q1) was defined as 'Whether Innovativeness, Proactiveness, and Risk-taking of the students relate to their IEO?' accordingly to the discussions above, the following hypotheses concerning IEO components are proposed:

H1: Innovativeness and creativity positively relates to IEO;

H2: Risk-taking positively relates to IEO;

H3: Proactiveness positively relates to IEO.

Hereafter the next question of the study (Q2) was stated as 'Whether HEIs contribute towards IEO development?' and the following four hypotheses were proposed:

H4: HEI relates to Innovativeness and creativity;

H5: HEI relates to Risk-taking;

H6: HEI relates to Proactiveness;

H7: HEI relates to IEO.

Since business education is the main area of the researcher's interests, the third question (Q3) was defined as "Whether IEO and intentions among students doing their major in business are higher than among technical university students?" and the following hypotheses were proposed:

H8: Dedicated programs in business or management positively relate to Innovativeness and creativity.

H9: Dedicated programs in business or management positively relate to Risk-taking.

H10: Dedicated programs in business or management positively relate to Proactiveness.

H11: Dedicated programs in business or management positively relate to IEO.

As was pointed out the social, cultural, political, and economic context makes a significant impact on an individual propensity to entrepreneurship, hereafter to identify the effect of the layers to the undergraduates' perception about IEO, the author included the measures applied in the previous studies of the authors in the research. Based on the discussion above was postulated:

H12: Social context, that is, state, friends, and family support positively relates to Innovativeness and creativity;

H13: Social context, that is, state, friends, and family support positively relates to Risk-taking;

H14: Social context, that is, state, friends, and family support positively relates to Proactiveness;

H15: Social context, that is, state, friends, and family support, positively relates to IEO.

### 2.2.2 IEO Research Methodology

The goals set at the beginning of the research determined the research methodology, namely, the use of a quantitative approach as this study tries to seek empirical support for created hypotheses that have been developed based on the consistent review of the secondary sources. The empirical research method is a survey, with the data collection tool being a questionnaire constructed to measure IEO with the seven items applied by other researchers in different environments (Bolton & Lane, 2012; Koe, 2016; Howard, 2020). Constructing the questionnaire for the research, the author included the measures used by other researchers to validate the findings in the sample of students doing their major in business and STEM undergraduates. The measures, their sources, and their correspondence to the developed questionnaire and IEO components are presented in Table 2.5 below.

In the questionnaire, IEO Index components correspond with the following questions (note – the ultimate questions sheet of the survey might be found in Table 5 in Appendix.

Creativity and Innovativeness = 4 questions (Q24, Q25, Q26, Q27)

Risk-taking = 2 questions (Q33, Q34)

Exploiting opportunities (proactiveness) = 1 question (Q28)

Some authors (Kollmann *et al.*, 2007)) stated that a high educational level is one of the factors in the environment that contributes to EIO development. As per the Global Entrepreneurship report (Autio, 2005), the educational level has an even more important impact on entrepreneurial decisions than economic factors. As was already mentioned, most of the studies in IEO with regards to social context measure this as the intersection of cultural, economic, and political contexts; hence the author included in the questionnaire the questions to identify the role of HEI on IEO and recognize whether business education has more influence to entrepreneurial orientation than STEM education. Hence the social economics layers' influence was measured by applying questions used in earlier studies:

1. Social Context. Family = 2 questions (Q18.10, Q45)
2. Social Context. Friends = 1 question (Q46)
3. Social Context. State = 1 question (Q18.9)
4. Social Context. Economics = 3 questions (Q47, Q48, Q49)

Table 2.5

The measures, their sources, their correspondence to the developed questionnaire and IEO component, created by author

	<b>Bolton and Lane (2012)</b>	<b>Koe, W. L. (2016)</b>	<b>Santos et al (2020)</b>	<b>Covin et al (2020)</b>	<b>Howard (2020)</b>	<b>IEO Index Components</b>
<b>Innovativeness and creativity</b>	I often like to try new and unusual activities that are not typical but not necessarily risky	Try new and unusual activities	I often like to try new and unusual activities.	When it comes to problem solving, I search for creative solutions instead of familiar ones	I often like to try new and unusual activities that are not typical but not necessarily risky	Among your friends, you are the person who uses new products, applications, programs, services
	I prefer a strong emphasis in projects on unique, one-of-a-kind	Prefer unique, one-of-a-kind approach	I prefer a strong emphasis on innovative	I quickly master new routines, procedures, and	I prefer a strong emphasis on unique, one-of-a-	You prefer a strong emphasis in projects on unique, one-of-a kind

	<b>Bolton and Lane (2012)</b>	<b>Koe, W. L. (2016)</b>	<b>Santos et al (2020)</b>	<b>Covin et al (2020)</b>	<b>Howard (2020)</b>	<b>IEO Index Components</b>
	approaches rather than revisiting tried and true approaches used before		approaches rather than previously tested and used approaches	new ways of working.	kind approaches rather than revisiting tried and true approaches used before	approaches, rather than revisiting tried and true approaches used before.
	I prefer to try my own unique way when learning new things rather than doing it like everyone else does	Try my own unique way		I have very little problems with renewal and change	I prefer to try my own unique way when learning new things rather than doing it like everyone else does	When you learn new things, you prefer to try your own unique way than to act like everyone else.
	I favour experimentation and original approaches to problem solving rather than using methods others use	Favour experimentation and original approach	I am in favour of trying new approaches to problem solving rather than using methods that others use			You prefer experimenting and original approach to problem solving instead of using methods that others use to solve problems
Risk-taking	I like to take bold action by venturing into the unknown	Take bold action by venturing into unknown	I like to venture into the unknown and make risky decisions	To be more productive I could act without permission of supervisor	I like to take bold action by venturing into the unknown	You like to make bold decisions, even going into unknown actions.
	I am willing to invest a lot of time and/or money on something that might yield a high return	Invest time/money on something that yield high return		I value new plans and ideas, even if I feel that they could fail in practice	I am willing to invest a lot of time and/or money on something that might yield a high return	In the situation of the need to decide, with high uncertainty of its result, you take a bold and aggressive attitude to maximize the probability of using potential opportunities
	I tend to act “boldly” in situations where risk is involved	Act boldly	I tend to act boldly in risky situations.	I could assist clients without first discussing this with supervisor	I tend to act “boldly” in situations where risk is involved	
Proactiveness	I usually act in anticipation of future problems, needs or changes	Act in anticipation of future problems			I usually act in anticipation of future problems, needs or changes	You usually act in anticipation of future problems, needs or changes
	I tend to plan ahead on projects	Plan ahead on projects	I tend to plan projects in advance		I tend to plan ahead on projects	
	I prefer to “step-up” and get things going on projects rather than sit and wait for someone else to do it	Prefer to step-up and get things going	I would rather get up and put projects in motion than waiting for someone else		I prefer to “step-up” and get things going on projects rather than sit and wait for someone else	

To investigate whether HEI has an impact on IEO, three more questions were added by the author:

1. Studying at the university encourages you to develop creative ideas to become an entrepreneur (Q42)
2. Your university provides the necessary knowledge in the field of entrepreneurship (Q43)
3. Studying at your university develops your abilities and entrepreneurial skills (Q44)

The studies were performed as a part of the SEAS Project (Survey on Entrepreneurship Attitude of Students) which has been an ongoing project at the Faculty of Management and Economics at Gdansk University of Technology (Poland) since 2008, while Lviv Polytechnic National University (Ukraine), Riga Technical University (Latvia), Sofia University St. Kliment Ohridski and Technical University of Sofia (Bulgaria), as well as Vilnius Gediminas Technical University (Lithuania), joined the project as research partners in 2019 – the year 2019 edition, for the first time, became international. Geographical scope justification is the following: the SEAS project addresses the emerging economies with similar historical background but different cultural values and beliefs in Central and Eastern Europe. Justification for the sample of the survey is conditioned by the scope of the SEAS project that is aimed to analyse the entrepreneurial attitudes of students in the regions mentioned above.

The survey was conducted among 1<sup>st</sup>-year students in the period 2019 to 2020. Of the research participants, students doing their major in business and students studying STEM disciplines, twenty different fields of studies in total. In sum number of respondents was 3631, where 1029 (28%) students were from Poland, 746 (21%) from Ukraine, 372 (10%) from Latvia, and 205 (6%) from Bulgaria, and 1279 (35%) from Lithuania. Overall, the sample contained 1588 (44%) female students and 2023 (56%) male students. At the country level - the sample from Poland had 459 (45%) females and 565 (55%) males. The sample from Ukraine included 392 (53%) female students and 352 (47%) male students. Latvian sample contained 138 (37%) females and 232 (63%) males. The sample from Bulgaria held 94 (46%) females and 110 (54%) males. Lithuanian sample contained 505 (40%) female students and 766 (60%) male students. Within the researched sample, the proportion of students doing their major in business-related disciplines and STEM students are represented as 541 (15%) and 3070 (85%). Similarly, to the total sample, on the country level, a significant part of the researched group belongs to STEM students: the selection of the students doing their major in business included 78 (14%) students from Poland, 190 (35%) students from Ukraine, 90 (18%) students from Latvia, 67 (12%) students from Bulgaria, and 110 (20%) students from Lithuania. STEM students' distribution within the sample of 3070 respondents was following: 946 (31%) from Poland, 552 (18%) from Ukraine, 274 (9%) from Latvia, 137 (5%) from Bulgaria, and 1161 (38%) from Lithuania.

All responses were anonymous. There were no specific titles for each section of the questionnaire. At the beginning of the survey, students were told that there were no right or wrong answers, and it was suggested to fill in the questionnaire following their best feelings. The survey was not a part of an exam and had no impact on the assessment of overall student performance. The five-point Likert scale measured students' agreement with the statements,

ranging from 1 (“strongly disagree”) to 5 (“definitely agree”). A categorical (Yes/No) scale was also used for some questions.

### 2.2.3 IEO Research Results

A set of statistical tests was performed using SPSS version 23. The measurement scale was analyzed through a reliability test. The value of Cronbach’s alpha for the IEO scale was 0.86, indicating high internal reliability of the measurement scale (Nunnally, 1978).

Descriptive statistics summary table for IEO and its components – Innovativeness and creativity, Risk-taking, and Proactiveness might be found in Table 6, Table 7, Table 8, Table 9, Table 10, and Table 11 in Appendix. Respondents of the survey rated themselves highest for Proactiveness (mean = 3,94; SD = 0,89), followed by Innovativeness and creativity (mean = 3,64; SD = 0,80), and Risk-taking (mean = 3,47; SD = 0,94). Results of IEO and its components are represented by mean score 3,64 (SD = 0,73). With respect to the country level perspective, the highest scores were demonstrated by the sample from Lithuania: Proactiveness (mean = 4,14; SD = 0,94), followed by Innovativeness and creativity (mean = 4,11; SD = 0,82), and Risk-taking (mean = 4,00; SD = 0,92), while IEO mean score was 4,08 (SD = 0,78). Lithuanian sample score is followed by the sample from Ukraine: Proactiveness (mean = 3,87; SD = 0,83), followed by Innovativeness and creativity (mean = 3,53; SD = 0,63), and Risk-taking (mean = 3,42; SD = 0,77), when IEO mean score was 3,55 (SD = 0,53). Latvian students rated themselves highest for Proactiveness (mean = 3,48; SD = 0,83), followed by Innovativeness and creativity (mean = 3,42; SD = 0,61), and Risk-taking (mean = 3,12; SD = 0,76), then IEO mean score was 3,34 (SD = 0,53). Respondents from Poland rated themselves highest for Proactiveness (mean = 3,98; SD = 0,81), followed by Innovativeness and creativity (mean = 3,29; SD = 0,68), and Risk-taking (mean = 3,12; SD = 0,83), IEO mean score was 3,34 (SD = 0,56). The sample from Bulgaria displayed the lowest scores in comparison to other samples. In the same way as other respondents, students in Bulgaria rated themselves highest for Proactiveness (mean = 3,61; SD = 0,82), followed by Innovativeness and creativity (mean = 3,26; SD = 0,74), and Risk-taking (mean = 2,77; SD = 0,85), IEO mean score was 3,17 (SD = 0,59). Interesting to note that patterns for IEO components scoring is similar for all countries, it could be partly explained by number of questions used to measure the components of IEO (Innovativeness and creativity - 4 questions, Risk-taking – 2 questions, and Proactiveness - 1 question). Visual representation of the country level findings stated above is shown on the Fig. 2.5-2.8 below.



Fig. 2.5 Respondents of the survey rated themselves for Proactiveness per country



Fig. 2.6 Respondents of the survey rated themselves for Innovativeness and creativity per country



Fig. 2.7 Respondents of the survey rated themselves for Risk-taking per country



Fig. 2.8 Results of IEO and its components are represented by the mean score per country

Mann-Whitney test was performed to investigate the impact of the demographic factor on the decision of the students on IEO to ensure whether the demographic variable impacted the results. The results are reported in the Table 12 in Appendix – the demographic factor had impact in the total sample as male students had higher scores for Innovativeness and creativity ( $U = 1465426,5, p < 0,01$ ), Risk-Taking ( $U = 1387711,5, p < 0,01$ ), and IEO ( $U = 1434180, p < 0,01$ ), while Proactiveness ( $U = 1508064, p = 0,09$ ) was equal for both gender as it has no significant difference. This is in alignment with evidence from Sun’s study (Sun *et al.*, 2020) where male and female (13% of the sample) respondents’ groups were considered homogeneous due to chi-square tests results, but in line with prior studies which establish that male respondents have higher risk-taking behavior than female entrepreneurs (Neneh *et al.* 2016; Ayub *et al.* 2013; Wagner 2007).

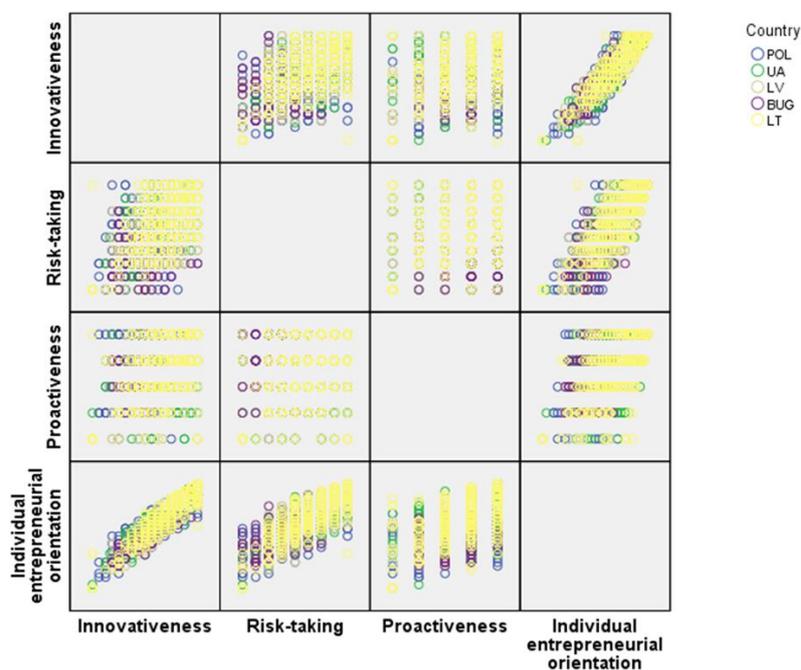


Fig. 2.9 Relationship between IEO and its components, total sample

The correlation analysis was applied to test H1-H4. The non-parametric Spearman correlation coefficient ( $r_s$ ) was chosen to measure the relationship between variables. Table 13 in the Appendix summarizes the results. The results indicated that all components of the IEO Index there recorded positive and significant correlations. Innovativeness and creativity recorded strongest significant association with IEO ( $r_s = 0,93; p < 0,01$ ), followed by Risk-taking ( $r_s = 0,82; p < 0,01$ ), and Proactiveness ( $r_s = 0,55; p < 0,01$ ). In addition, the results also showed that correlation coefficients between Proactiveness and Innovativeness and creativity ( $r_s = 0,41; p < 0,01$ ), Proactiveness and Risk-taking ( $r_s = 0,36; p < 0,01$ ), and Innovativeness and creativity and Risk-taking ( $r_s = 0,62; p < 0,01$ ) were positive and significant. Therefore, the relationship between Innovativeness and creativity, Risk-taking, Proactiveness, and IEO was statistically significant. A visual representation of the relationship between IEO and its components is presented in the Fig. 2.9. As such, H1, H2, and H3 were supported. Hereafter responding to the 1<sup>st</sup> question of the study, “Whether Innovativeness and creativity,

Proactiveness, and Risk-taking of the students relate to their IEO,” it was revealed that there are strong relations.

H4 to H7 postulating the relationships among HEI and IEO components were tested using the same non-parametric correlation analysis method described above. The results are shown in the Table 14 and Table 15 in Appendix. The results indicated that all components of the IEO Index there recorded a positive and significant correlation with the HEI. Exploring the total sample IEO showed the strongest significant association with the statement that studying in the university encourage to develop creative ideas to become entrepreneur ( $r_s = 0,49$ ;  $p < 0,01$ ), followed by Innovativeness and creativity ( $r_s = 0,47$ ;  $p < 0,01$ ), Risk-taking ( $r_s = 0,42$ ;  $p < 0,01$ ), and Proactiveness ( $r_s = 0,26$ ;  $p < 0,01$ ). In addition, the results also showed significant and positive correlations between entrepreneurial skills development in university and IEO ( $r_s = 0,45$ ;  $p < 0,01$ ), Innovativeness and creativity ( $r_s = 0,43$ ;  $p < 0,01$ ), Risk-taking ( $r_s = 0,40$ ;  $p < 0,01$ ), and Proactiveness ( $r_s = 0,24$ ;  $p < 0,01$ ). Apart from that, there is a significant positive relationship between IEO and knowledge in the field of entrepreneurship provided in the university, Innovativeness and Creativity with the university provided knowledge in the field of entrepreneurship, Risk-taking knowledge in the field, and Proactiveness with the gained knowledge (accordingly,  $r_s = 0,44$ ;  $r_s = 0,44$ ;  $r_s = 0,38$ ;  $r_s = 0,21$ ;  $p < 0,01$ ). Graphical representation is presented as a heat map in the Table 2.6.

With respect to the country-level results, then the strongest correlation was revealed by Lithuanian sample: positive and significant correlation coefficients between encouraging studies in the university developing creative ideas to become an entrepreneur with IEO ( $r_s = 0,62$ ;  $p < 0,01$ ), with Innovativeness and Creativity ( $r_s = 0,61$ ;  $p < 0,01$ ), Risk-taking ( $r_s = 0,52$ ;  $p < 0,01$ ), and Proactiveness ( $r_s = 0,48$ ;  $p < 0,01$ ). There is also significant and positive correlation coefficient between necessary knowledge in the field of entrepreneurship provided in the university and IEO ( $r_s = 0,59$ ;  $p < 0,01$ ), Innovativeness and Creativity ( $r_s = 0,58$ ;  $p < 0,01$ ), Risk-taking ( $r_s = 0,48$ ;  $p < 0,01$ ), and Proactiveness ( $r_s = 0,46$ ;  $p < 0,01$ ). As well the correlation coefficient of entrepreneurial skills development by studying at university and IEO was significant and positive ( $r_s = 0,58$ ;  $p < 0,01$ ), the same as Innovativeness and Creativity ( $r_s = 0,57$ ;  $p < 0,01$ ), Proactiveness ( $r_s = 0,49$ ;  $p < 0,01$ ), and Risk-taking ( $r_s = 0,47$ ;  $p < 0,01$ ). Graphical representation of the correlations is presented as heat map on the Table 2.7.

Table 2.6

## IEO components correlation, the total sample

		Innovativeness	Proactiveness	Risk-taking	Individual entrepreneurial orientation	Studying at the university encourages you to develop creative ideas to become an entrepreneur	Your university provides the necessary knowledge in the field of entrepreneurship	Studying at your university develops your abilities and entrepreneurial skills
Spearman's rho	Innovativeness	1,00	0,41	0,62	0,93	0,47	0,44	0,43
	Proactiveness	0,41	1,00	0,36	0,55	0,26	0,21	0,24
	Risk-taking	0,62	0,36	1,00	0,82	0,42	0,38	0,40
	Individual entrepreneurial orientation	0,93	0,55	0,82	1,00	0,49	0,44	0,45
	Studying at the university encourages you to develop creative ideas to become an entrepreneur	0,47	0,26	0,42	0,49	1,00	0,68	0,70
	Your university provides the necessary knowledge in the field of entrepreneurship	0,44	0,21	0,38	0,44	0,68	1,00	0,82
	Studying at your university develops your abilities and entrepreneurial skills	0,43	0,24	0,40	0,45	0,70	0,82	1,00

Table 2.7

## IEO components correlation, Lithuanian sample

Country		Innovativeness	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Risk-taking	Individual entrepreneurial orientation	Studying at the university encourages you to develop creative ideas to become an entrepreneur	Your university provides the necessary knowledge in the field of entrepreneurship	Studying at your university develops your abilities and entrepreneurial skills
LT	Innovativeness	1,000	0,608	0,702	0,941	0,609	0,579	0,566
	Proactiveness (You usually act in anticipation of future problems,	0,608	1,000	0,56	0,73	0,478	0,458	0,493
	Risk-taking	0,702	0,56	1,000	0,868	0,519	0,48	0,467
	Individual entrepreneurial orientation	0,941	0,73	0,868	1,000	0,624	0,586	0,58
	Studying at the university encourages you to develop creative	0,609	0,478	0,519	0,624	1,000	0,717	0,692
	Your university provides the necessary knowledge in the field of	0,579	0,458	0,48	0,586	0,717	1,000	0,821
	Studying at your university develops your abilities and entrepreneurial	0,566	0,493	0,467	0,58	0,692	0,821	1,000

Interestingly, that in the other countries, results in the other sub-samples were not so harmonized; in Bulgaria correlation coefficient of IEO as well as Risk-taking with creative ideas development, knowledge in the entrepreneurship field, and entrepreneurial skills development are positive and significant (accordingly  $r_s = 0,22$ ;  $r_s = 0,20$ ;  $r_s = 0,22$ ;  $p < 0,01$ , and  $r_s = 0,36$ ;  $r_s = 0,28$ ;  $r_s = 0,33$ ;  $p < 0,01$ ), while Proactiveness demonstrated negative and significant correlation with creativity development in the university ( $r_s = -0,18$ ;  $p < 0,05$ ) and development entrepreneurial skills in HEI ( $r_s = -0,15$ ;  $p < 0,05$ ), Innovativeness and Creativity has positive and significant correlation only with creative skills development to become entrepreneur ( $r_s = 0,15$ ;  $p < 0,05$ ). Graphical representation of the data is presented as heat map on the Table 2.8. Similar situation was represented in the Latvian sample: correlation coefficient of IEO as well as Innovativeness and Creativity with creative ideas development, knowledge in the entrepreneurship field, and entrepreneurial skills development are positive and significant ( $r_s = 0,27$ ;  $r_s = 0,21$ ;  $r_s = 0,17$ ;  $p < 0,01$ ), and ( $r_s = 0,30$ ;  $r_s = 0,23$ ;  $r_s = 0,17$ ;  $p < 0,01$ ), while

Proactiveness demonstrated positive and significant correlation only with creativity development in the university ( $r_s = 0,15$ ;  $p < 0,01$ ) and development entrepreneurial skills in HEI ( $r_s = 0,15$ ;  $p < 0,01$ ), Risk-taking has positive and significant correlation only with creative skills development to become entrepreneur ( $r_s = 0,13$ ;  $p < 0,05$ ). Graphical representation of the Latvian data is presented as heat maps on the Table 2.9.

Table 2.8

IEO components correlation, Bulgarian sample

Country	Innovativeness	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Risk-taking	Individual entrepreneurial orientation	Studying at the university encourages you to develop creative ideas to become an entrepreneur	Your university provides the necessary knowledge in the field of entrepreneurship	Studying at your university develops your abilities and entrepreneurial skills
BUG	Innovativeness	1,000	0,229	0,384	0,915	0,153	
	Proactiveness (You usually act in anticipation of future problems,	0,229	1,000		0,341	-0,177	-0,148
	Risk-taking	0,384		1,000	0,668	0,363	0,278
	Individual entrepreneurial orientation	0,915	0,341	0,668	1,000	0,224	0,201
	Studying at the university encourages you to develop creative	0,153	-0,177	0,363	0,224	1,000	0,825
	Your university provides the necessary knowledge in the field of			0,278	0,201	0,825	1,000
	Studying at your university develops your abilities and entrepreneurial		-0,148	0,331	0,216	0,808	0,866

Table 2.9

IEO components correlation, Latvian sample

Country	Innovativeness	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Risk-taking	Individual entrepreneurial orientation	Studying at the university encourages you to develop creative ideas to become an entrepreneur	Your university provides the necessary knowledge in the field of entrepreneurship	Studying at your university develops your abilities and entrepreneurial skills
LV	Innovativeness	1,000	0,333	0,348	0,878	0,296	0,234
	Proactiveness (You usually act in anticipation of future problems,	0,333	1,000	0,21	0,521	0,149	0,146
	Risk-taking	0,348	0,21	1,000	0,684	0,134	
	Individual entrepreneurial orientation	0,878	0,521	0,684	1,000	0,274	0,206
	Studying at the university encourages you to develop creative	0,296	0,149	0,134	0,274	1,000	0,495
	Your university provides the necessary knowledge in the field of	0,234			0,206	0,495	1,000
	Studying at your university develops your abilities and entrepreneurial	0,174	0,146		0,174	0,515	0,653

Ukrainian sample signified less number of positive and significant correlation coefficients in comparison with the other samples; there are correlations between creative skills development in university and IEO ( $r_s = 0,17$ ;  $p < 0,01$ ), Innovativeness and Creativity ( $r_s = 0,14$ ;  $p < 0,01$ ), and Risk-taking ( $r_s = 0,13$ ;  $p < 0,01$ ), in addition to correlation between entrepreneurial skills development with Innovativeness and Creativity ( $r_s = 0,12$ ;  $p < 0,01$ ) and IEO ( $r_s = 0,12$ ;  $p < 0,01$ ). The least number of correlations was presented in the sample from Poland: there are positive and significant correlation coefficients only for creative skills development in HEI with IEO ( $r_s = 0,18$ ;  $p < 0,01$ ), Innovativeness and Creativity ( $r_s = 0,17$ ;  $p < 0,01$ ), Risk-taking ( $r_s = 0,13$ ;  $p < 0,01$ ), and entrepreneurial skills development in HEI with Risk taking ( $r_s = 0,09$ ;  $p < 0,01$ ). Graphical representation of the Latvian and Ukrainian data is presented as heat maps on the Table 2.10, and Table 2.11. In sum, with regards to the total sample of the students from Bulgaria, Latvia, Lithuania, Poland, and Ukraine, all relationship

hypothesized were significant: H4, H5, H6, and H7 were supported. Responding to the 2nd question of the study is possible to state that HEI contributes towards IEO development.

Table 2.10

IEO components correlation, Ukrainian sample

Country		Innovativeness	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Risk-taking	Individual entrepreneurial orientation	Studying at the university encourages you to develop creative ideas to become an entrepreneur	Your university provides the necessary knowledge in the field of entrepreneurship	Studying at your university develops your abilities and entrepreneurial skills
UA	Innovativeness	1,000	0,171	0,42	0,89	0,139		0,124
	Proactiveness (You usually act in anticipation of future problems,	0,171	1,000	0,106	0,361			
	Risk-taking	0,42	0,106	1,000	0,719	0,126		
	Individual entrepreneurial orientation	0,89	0,361	0,719	1,000	0,17		0,116
	Studying at the university encourages you to develop creative	0,139		0,126	0,17	1,000	0,466	0,564
	Your university provides the necessary knowledge in the field of					0,466	1,000	0,697
	Studying at your university develops your abilities and entrepreneurial	0,124			0,116	0,564	0,697	1,000

Table 2.11

IEO components correlation, Polish sample

Country		Innovativeness	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Risk-taking	Individual entrepreneurial orientation	Studying at the university encourages you to develop creative ideas to become an entrepreneur	Your university provides the necessary knowledge in the field of entrepreneurship	Studying at your university develops your abilities and entrepreneurial skills
POL	Innovativeness	1,000	0,19	0,365	0,887	0,17		
	Proactiveness (You usually act in anticipation of future problems,	0,19	1,000	0,097	0,359			
	Risk-taking	0,365	0,097	1,000	0,691	0,127		0,085
	Individual entrepreneurial orientation	0,887	0,359	0,691	1,000	0,178		
	Studying at the university encourages you to develop creative	0,17		0,127	0,178	1,000	0,532	0,561
	Your university provides the necessary knowledge in the field of					0,532	1,000	0,756
	Studying at your university develops your abilities and entrepreneurial			0,085		0,561	0,756	1,000

Hypotheses from H8 to H11 describe the relationship between business education, Innovativeness and Creativity, Risk-taking, Proactiveness, and IEO. The hypotheses were tested with the Mann-Whitney test and logistic regression analysis. The analysis was used to compare STEM respondents and those doing their major in marketing, economics, entrepreneurship, or management. Mann-Whitney test was performed to investigate whether belongingness to STEM or MEM groups impacts IEO, Innovativeness and Creativity, Risk-taking, and Proactiveness. The results are shown in the Table 16, Table 17, and Table 18 in Appendix. In the total sample difference between two groups of students was not revealed for all the researched elements except for Proactiveness ( $U = 751984,5, p < 0,01$ ), visual representation of IEO components distribution between two groups of respondents that are presented as a box-plot are displayed on the Fig. 2.10 and Fig. 2.11 as well as IEO relations to its components within the two groups on the Fig. 2.12 ‘IEO and the relations of its component

for STEM students' and Fig. 2.13 'IEO and relations of its components for business-oriented students'.

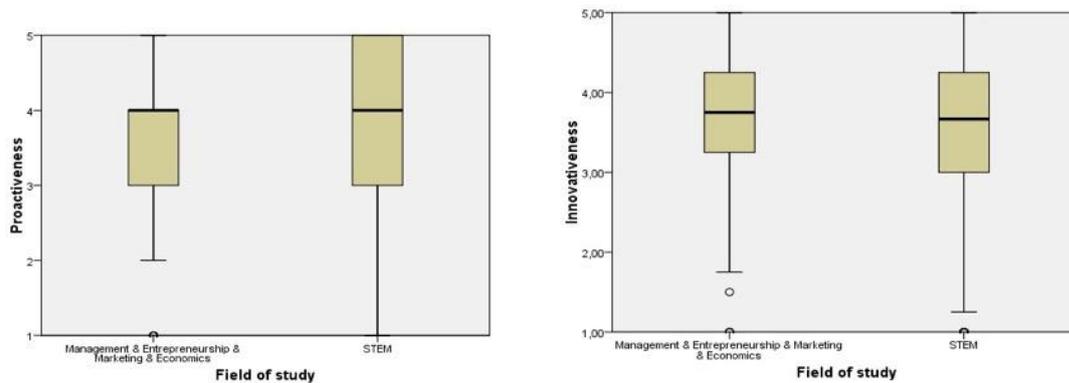


Fig. 2.10 Box plot graphs for Proactiveness and Innovativeness and Creativity in different fields of study, the total sample

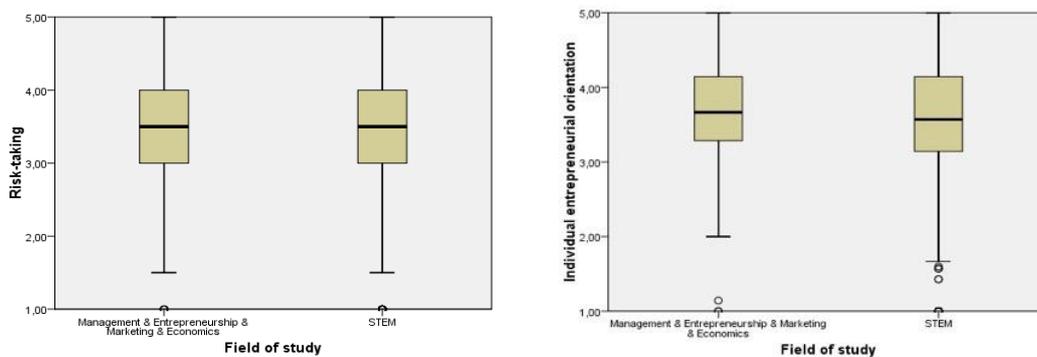


Fig. 2.11 Box plot graphs for Risk-Takings and IEO in different fields of study, the total sample

With regards to the country level specifics, then it is interesting to note that the trend continues only for Latvian sample (IEO ( $U = 12349$ ;  $p = 0,52$ ), Innovativeness and Creativity ( $U = 12096,5$ ;  $p = 0,40$ ), Risk-taking ( $U = 11794,5$ ;  $p = 0,37$ ), and Proactiveness ( $U = 12687,5$ ;  $p = 0,86$ ), while in other countries there are noticeable differences between students doing studies in engineering and managerial disciplines. The most significant differences among the two groups that were represented in Lithuanian (IEO ( $U = 50017,5$ ;  $p < 0,01$ ), Innovativeness and Creativity ( $U = 50591,5$ ;  $p < 0,01$ ), Risk-taking ( $U = 51870,5$ ;  $p < 0,01$ ), and Proactiveness ( $U = 54752$ ;  $p < 0,01$ ) and Bulgarian samples IEO ( $U = 2980$ ;  $p < 0,01$ ), Innovativeness and Creativity ( $U = 3393$ ;  $p < 0,05$ ), Risk-taking ( $U = 2341,5$ ;  $p < 0,01$ ), and Proactiveness ( $U = 3461$ ;  $p < 0,05$ ). Among the students in Ukrainian sample there is difference between two students' group with respect to Risk-taking ( $U = 44313$ ;  $p < 0,05$ ) and IEO ( $U = 44438$ ;  $p < 0,01$ ), but no difference for Innovativeness and Creativity ( $U = 46085$ ;  $p = 0,08$ ) and Proactiveness ( $U = 46939$ ;  $p = 0,15$ ). Among the students in the sample from Poland the situation is totally opposite to the previously mentioned sample - there are no difference between two students' group with respect to Risk-taking ( $U = 35543,5$ ;  $p = 0,39$ ) and IEO ( $U = 34571$ ;  $p = 0,21$ ), but there is difference with respect to Innovativeness and Creativity ( $U =$

32264,5;  $p < 0,05$ ) and Proactiveness ( $U = 30398$ ;  $p < 0,01$ ). The results of logistic regression support observations derived from correlation analysis. It was found that, holding Risk-taking and Innovativeness and Creativity constant, the odds belonging to STEM increased by 47,5% (95% CI [34%, 62,5%]) for a one-unit increase in Proactiveness. The results of the logistic analysis are shown in the Table 21 in Appendix. Therefore, even though the researched hypotheses were supported or partially supported in the context of the countries, with regards to the whole sample that defines the frames of the research, H8, H9, and H11 were rejected, while H10 was rejected too as sample of the students doing their studies in business-oriented disciplines had no positive correlation. Answering the 3<sup>rd</sup> question of the study “Whether IEO and intentions among students doing their major in business is higher than among technical university students?” is possible to conclude that business education students do not demonstrate expected higher values in IEO in comparison to STEM undergraduates.

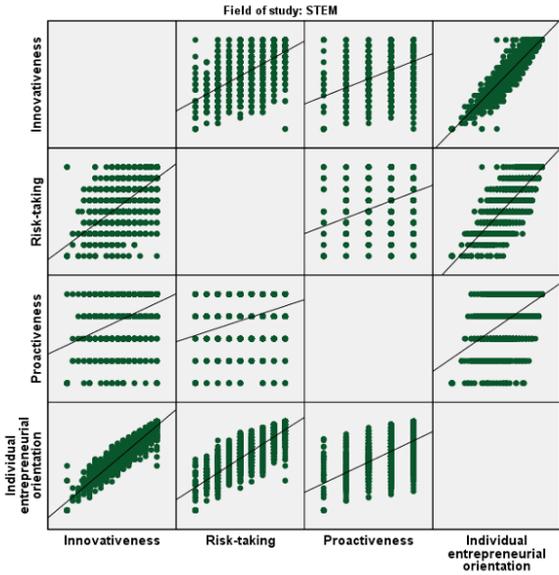


Fig. 2.12 IEO and the relations of its components for STEM students

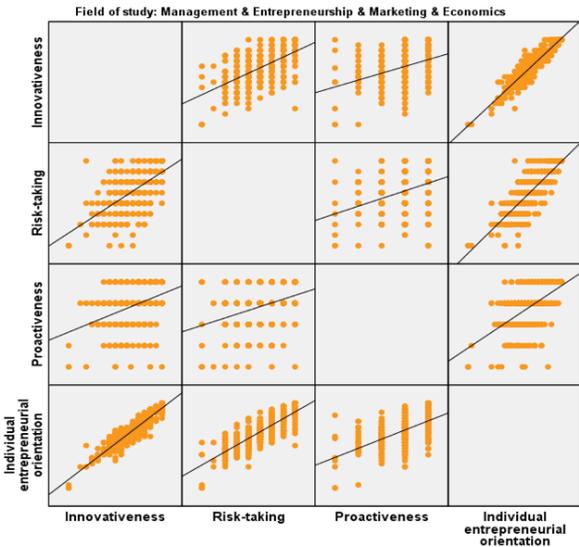


Fig. 2.13 IEO and the relations of its components for business-oriented students

Hypotheses H12 to H15 propose relationships among social context and IEO. The hypotheses were tested with correlation analysis. The results are shown in the Table 19 and Table 20 in Appendix. IEO and other elements demonstrated significant positive relationship with social context (IEO ( $r_s = 0,54$ ;  $p < 0,01$ ), Innovativeness and Creativity ( $r_s = 0,51$ ;  $p < 0,01$ ), Risk-taking ( $r_s = 0,47$ ;  $p < 0,01$ ), and Proactiveness ( $r_s = 0,32$ ;  $p < 0,01$ )). Interestingly that IEO recorded strongest positive relationship with Economics ( $r_s = 0,44 - 0,52$ ;  $p < 0,01$ ), followed by strong positive relationship with friends' support ( $r_s = 0,35$ ;  $p < 0,01$ ) and positive relations with family ( $r_s = 0,28 - 0,30$ ;  $p < 0,01$ ), as well as positive relations with Legislation ( $r_s = 0,28$ ;  $p < 0,01$ ). Worth mentioning that from the country level perspective samples from Lithuania and Latvia demonstrated relatively stronger positive relations IEO with social context (accordingly  $r_s = 0,79$ ;  $p < 0,01$  and  $r_s = 0,28$ ;  $p < 0,01$ ), while other samples have reported non-significant (Poland, Ukraine) or weak relations (Bulgaria). Nevertheless, as the total cross-country sample frames the research, it is possible to conclude that H12, H13, and H15 are supported.

### Conclusions

Analyzing the competences demanded by the labor market, it has been discovered that entrepreneurial competence is essential for employability. There are certain disagreements between the employers (entrepreneurs) and educational and training institutions on the priorities of the specific competences that are demanded and trained that leads to understanding that the entrepreneurial education needs to be more harmonized with the expectations of the labour market. The data and theory triangulation revealed the core elements for entrepreneurial competence development in the context of HEI, these elements are proactiveness, risk-taking, and innovativeness and creativity.

The entrepreneurial competence of the students' stakeholders' group was measured through a prism of their readiness and attitude towards a potential entrepreneurial career. Individual Entrepreneurial Orientation Index, based on Innovativeness and Creativity, Risk-taking, and Proactiveness components, was developed to evaluate the level of entrepreneurial competence among the students. It was discovered that HEI impacts the formation and development of the Innovativeness and Creativity, Risk-taking, Proactiveness, and IEO. However, it was also detected that business educational institutions do not significantly impact entrepreneurial orientation development compared to other HEIs that corresponds to the results of the first phase and supports the statement that entrepreneurial education insufficiently harmonized with the market needs. Finally, the research results demonstrated the importance of the social context for developing entrepreneurial competence.

Within the scope of the Chapter 2 the following scientific novelties have been identified:

- According to the needs of HEI's stakeholders in three European countries, a level of entrepreneurial competence importance has been explained, and HEI's performance in terms of its delivery has been evaluated. The different stakeholders' groups stressed the significance of the competence for employability.

- Competencies developed by business education and required and expected by the labor market are identified. It was disclosed that the core competencies, including creativity, risk-taking, and proactiveness, are relevant for managers and entrepreneurs.
- Individual Entrepreneurial Orientation (IEO) Index is developed as a composite indicator based on the pillars of innovativeness and creativity, risk-taking, and proactiveness. The IEO Index measures the students' entrepreneurial competence development level.
- The IEO research was conducted in five HEIs in different countries to measure the entrepreneurial competence level of the students. The different IEO level is a subject of HEI impacts on the formation and development of entrepreneurial competence.

The stated above makes possible to confirm the 2<sup>nd</sup> and 3<sup>rd</sup> theses for defense as supported:

- Thesis 2. Although the managerial and entrepreneurial competences are partially overlapped, the core competences for managers and entrepreneurs are not different and are related to creativity, risk-taking, and proactivity.
- Thesis 3. Entrepreneurial competence of the business education students can be measured through Individual Entrepreneurial Orientation competence, which is based on innovativeness and creativity, risk-taking, and proactiveness.

The next chapter begins with an overview of agile methods and decision-making tools as cross-industry benchmarks to evaluate and monitor the state of the HEIs delivering business education and provide a holistic view of the HEI as a system. Given the above, Chapter 3, “Enhancement of business education implementation based on stakeholder requirements,” describes the developed model for HEI assessment.

### **3 ENHANCEMENT OF BUSINESS EDUCATION IMPLEMENTATION BASED ON STAKEHOLDER REQUIREMENTS**

#### **3.1 Agile Tools for System Evaluation and Lean Management**

As it was described in the previous chapters, there is a demand for close interaction between the HEI and stakeholders; however, the stakeholders' expectations are not always met. According to research which is described in Chapter 1, there are evidences that external stakeholders' requirements make influence business education implementation. In accordance with the research results in Chapter 2, it is possible to state that there are pieces of evidence that the IEO Index can assist in evaluating a higher education institution's influence on the transformation of students' competences.

Although different stakeholders' groups stressed the significance of entrepreneurial competence for employability, there are convincing findings that HEIs and business schools as their inseparable parts require today for new prompt methods to react to the market needs proactively and provide educational service that is sufficiently harmonized with the market demand. Hence, educational institutions face the challenge of incorporating new agile, fast decision-making practices into the management of the organizations. The third chapter outlines the essential part of the research – the development and testing of the methodology for assessing business education implementation, taking into account the stakeholders' requirements that aimed to solve the problems discovered in the scope of the research.

##### ***Agile Management***

Agility was coined in information technology – the industry was revolutionized with agile innovation methods more than two decades ago, improving the time to market, the quality of the developed products, and the productivity and motivation of the IT team. Agile methodologies are widening across different industries and functions, including automotive manufacturers (Saab and John Deere), logistics providers (C.H.Robinson), and even wineries (Mission Bell Winery). Struggling to use their current management practices due to the necessity for prompt decision making, the companies adopt agile management theory; researchers recognized enablers of the agile methods as well as some “hybrid” management models for different industries as opportunities for organizations (Edivandro *et al.*, 2014). Other researchers, analyzing the agile approach in software development and industrial projects management, noted that agile is interdisciplinary and enhances an organization's flexibility (Jovanovic *et al.*, 2015). These studies stressed the importance of cross-industries benchmarking for bringing new, adaptable ideas from organizations across different industries and assessing benchmarking as a base for an organization's competitive positioning. Although agile principles implementation in higher education is still rare, business schools' accreditation authority, in its recent report (AACSB, 2020), reminded us that the speed of business change

tends to grow, resulting in new needs for skills, knowledge, and new methods for business schools. Porto Business School continued the idea by presenting at a recent Baltic Management Development Association conference in September 2020 a case study on a new MBA designed and marketed in 5 months (Porto Business school, n.d.).

Lean management is another approach which complements agile methodologies. Lean is based on systematically analyzing processes and value streams to decrease waste and improve product quality and customer satisfaction. Lean management is for routine operations. It brings an organization their systemic thinking of continuous improvement and focuses more on customer-oriented tasks that bring value (Lean Enterprise Institute, n.d.). Authors declared that using the same or a smaller number of resources Lean Thinking contributes to information processes and flows called Lean Information Management (Hicks, 2007; Bevilacqua *et al.*, 2015). Hence there is a call for modeling and representation of techniques to achieve their efficiency, as was mentioned by Chinosi and Trombetta in their introduction to Business Process Modelling Notation (BPMN) standard: “Within the context of Lean Information Management, it is important to understand that every company has its business processes” – this considered as critical reasoning for a common language for different stakeholders (Chinosi & Trombetta, 2012). In more recent studies were identified that the modeling notation, a combination of Industry 4.0, Lean Thinking, and Information Systems principles per se, shows the inefficiency in information flows; the main goals of the graphical notation are process modeling during the data collection, analysis and visualization of the procedures (Arromba *et al.*, 2019).

Considering HEI as a system, the author explores whether it is possible to increase the agility of the organization by applying as a cross-industry benchmark the modern methodologies used initially in software development business where agile methods have been applied for the last two decades and where nimble decision-making considered as a collaborative, iterative, and transparent process (Agile Software development manifesto, n.d.). Researchers agree with practitioners - agile methodologies, especially the latest batch of systems development methodologies (SDMs), are considered the most suitable for dealing with frequently changed business requirements (Chan & Thong, 2009). Another researcher indicated that volatile situations in modern universities require leaders with agile leadership skills to respond to the dynamics: “Agility helps leaders develop relationships, meet the needs of students, stakeholders, and organizations, and anticipate future concerns” (Taylor, 2017). The agile project management approach in higher education helps in successful project implementation and change management (Macheridis, 2017). As for business education, researchers believe that agile business school is a new standard that brings new techniques and technologies that make education more relevant today and prepare graduates to build and lead agile organizations in the future; hence a new business school management requires a framework providing a systematic and holistic model for the organization management (Gupta and Bharadwaj, 2013).

In view of the stated above and considering agility as one of the critical characteristics of HEI nowadays, the author of the Doctoral Thesis assumes it is possible to apply agile software development practices to the educational institution. Using the benchmark for tracking the

status of the academic endeavor, the agile framework can provide HEIs with a tool for process management and decision-making to plan the following actions.

### ***Systemic Decision Making***

The Foundation of the decision-making studies is based on the works of James March, Herbert Simon, and Henry Mintzberg. The managerial decision-making process has been coming to complex circumstances, short time, and the state of “bounded rationality.” Still, decision-making is one of the essential skills required to lead an organization, as the success of an organization relies on the quality of the decisions made by its managers and how well the decisions are implemented. For example, the multiple-criteria approach is a well-known branch of decision-making that ranks one or more alternatives from a set of available options with multiple attributes. Multiple-criteria decision-making (MCDM) is assumed to be a practical framework for evaluating various conflicting criteria and making decisions (Chang *et al.*, 2013). To support the decision-making process researchers proposed another comprehensive multi-criteria decision-making advanced available-to-promise (AATP) framework (Okongwu *et al.*, 2012). One of popular standards in the industry nowadays is decision-making notation (DMN), which is a modeling language and note for the precise specification of business decisions and business rules. DMN is easily readable by different stakeholders involved in decision management. The framework provides a tool to model the decision-making and help all stakeholders understand a complex decision-making domain using diagrams. Object Management Group reported in 2018 that organizations such as NASA, Toshiba, Maya Clinic, software development giants, and universities benefit from using the standard as it helps develop a systemic approach for decision-making.

Hence, researchers propose the concept of systemic thinking as a more efficient, crucial new approach for decision-making that is recommended to deal with complexity. Addressing unpredictable and changing environment, researchers believe that a rigid plan for making decisions is not relevant as it does not address the challenges of strategic management in organizations hence in dealing with complexity, the ideal decision-making process must be flexible and self-organized, so incorporating the culture of systemic thinking is a need of decision-makers to smooth the process (Pidd, 2004; Dawidowicz, 2010). Continuing the thoughts, researchers emphasized the rapid increase in complexity in the business world. They suggested systemic thinking as the best option to deal with complex challenges as it becomes a driver of competitive advantage for organizations and is considered a “pre-condition for success” (Smith *et al.*, 2010). It was found that systemic thinking encourages a dynamic, more holistic perspective, impacting the decision makers’ ability to manage processes about complex problems (Reynolds *et al.*, 2012). At the same time, theorists say there is no single system thinking technique. Still, different theories and methods are designed to address complex problems in business organizations (Peters, 2014).

### ***Essence approach for system assessment***

In software development Essence Alpha States approach is a governance approach to evaluate the status of a system; the methodology aims to develop a holistic view of the multiple

elements of a system that forms an integrated model for decision making and is measured with KPIs. Alpha State Cards aim to track Alphas status where Alphas are elements of an ecosystem which must be followed to succeed in the endeavor or solution development. Alphas states are changed due to activities performed by the team to implement a solution, meeting stakeholders' needs. Alphas states are checked with control questions shaped as checklists. The framework is based on the Essence Kernel, considered a new industry standard as it does not make processes so large, complex and cumbersome. Alphas help track the status of a system or a project, plan the following steps, and represent key performance indicators. OMG Standard defines these cards are entirely method, life-cycle, process, practice, and philosophy independent and can be applied anywhere (OMG standards, 2018).

Essence kernel was developed by a community of software engineering experts called Software Engineering Method and Theory (SEMAT), which distilled this common ground from many system engineering methodologies. Later the practice was adopted by the Object Management Group (OMG) as a standard for providing common elements, language, and framework for describing engineering methods, primarily in the software development industry; however, there are several successful cases of the framework implementation in other industries as Essence contains no strict regulations to force into execution, but instead it is a basis on which existing or new methods can be described, compared and improved; for example, Fujitsu UK has been using Essence, in particular Alpha state checklists, in iteration planning with customers (Cunningham, 2013). Munich Re, a large insurance company (Perkens-Golomb, 2013) and a Chinese global telecommunications equipment vendor also applied Essence to their needs (Jacobson, 2014), reporting on rapid and sustainable agile transformation. A research institution SINTEF and educational institutions: Carnegie Mellon University and the National University of Columbia, used Essence for research and education improvement (Zapata & Jacobson, 2014; Péraire & Sedano, 2014). Hereafter, the author of the thesis considered these references as the proof of the approach adoption to HEI and business school needs.

As it has been stated above, Essence was manifested in these cases as a kernel of essential universal elements providing a roadmap guiding improvement efforts towards progress and health in a holistic manner of basic dimensions: stakeholders, requirements, system, and team. What is essential, Essence enabled the companies to work both with agile or traditional settings and as those in-betweens supporting the teams in achieving measurable results. Essence possesses a few differentiators that make the approach unique: 1) it relies heavily on the "separation of concerns" principle - Essence addresses professionals and allows extending the application of Essence to many groups of interests; 2) It also relies on the principle of agile while working with methods, which means that Essence supports teams to evolutionarily improve their ways of working, allowing them to move at their own pace; 3) It has been designed with significant attention paid to syntax, meaning that the progress and health progression is made concrete through a deck of Alpha state cards, which can be used flexibly in various ways, from planning work, conducting the actual work, and finalizing it.

As it has been mentioned above, the Essence Kernel is organized into three categories, each containing several parts, such as 1) Alphas - that represent the essential things to work with and

describe the kind of things that the team will manage, produce, and use in the process of developing, maintaining, and supporting, and, as such, are relevant to assessing the progress and health of the endeavor; 2) Activity Spaces - that are representations of the essential things to do and which describe the challenges a team faces when developing, maintaining, and supporting systems and the kinds of things that the team will do to meet them; 3) Competencies represent the critical capabilities required to carry out the work.

Being organized into three discrete areas of concern, each focusing on a specific aspect, the Kernel contains, as shown below (Fig. 3.1), the following areas:

Customer – the area of concern contains everything to do with the actual use and exploitation of the system to be produced.

Solution – the area of concern contains everything to do with the specification and development of the system.

Endeavor – the area of concern contains everything to do with the team and how they work.

All Essence elements - Alphas, activity spaces, and competencies - are grouped following the three areas of concern (Fig. 3.1).



Fig. 3.1 Three areas of concern

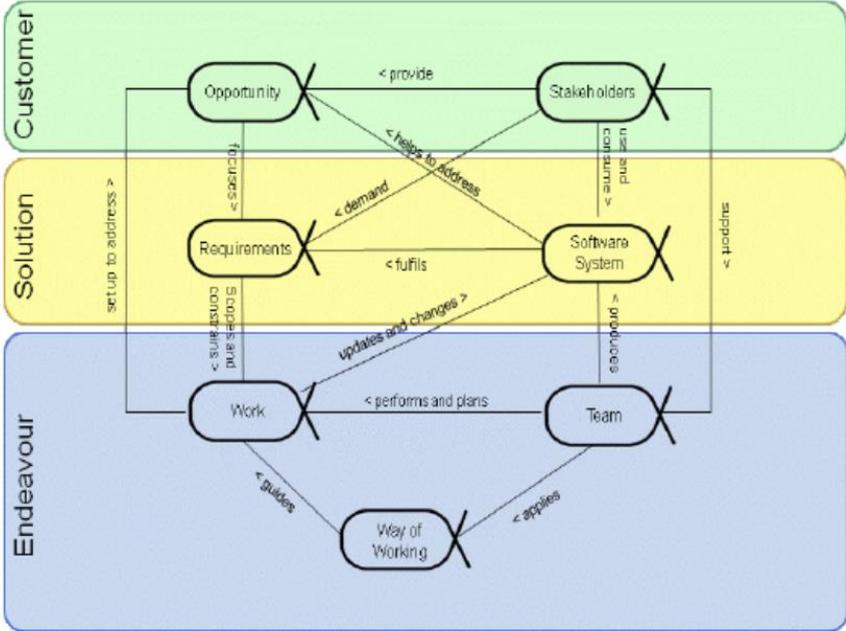


Fig. 3.2 Kernel Alphas

As shown in Fig. 3.2, the holistic, systemic view of Essence unites seven Alphas: stakeholders, opportunity, requirements, system, work, way of working, and team. Apart from the Alphas, fifteen activity spaces (Fig. 3.6) and six competencies (Fig. 3.7) will be described afterward. The kernel Alphas capture the key concepts involved in the process, allow the progress and health of any software engineering endeavor to be tracked and assessed, and provide the common ground for methods and practices. The Alphas each have a small set of pre-defined states to evaluate progress and health. Associated with each state is a collection of predefined checklists. Alphas represent the most important things to monitor and progress; a visual representation of their dependencies and relations with areas of concern are shown in Fig.29.

The following symbol visualizes an Alpha (Fig. 3.3), either containing the name of the Alpha or with the expression of the Alpha placed below the emblem:



Fig. 3.3 Alpha symbol



Fig. 3.4 Alpha association

The Alpha Association that defines a relationship between two alphas is visualized by a solid line connecting two associated Alphas where an open arrowhead '>' or '<' next to the name of the association and pointing along the association line indicates the order of reading and understanding the relationship between the Alphas, see Fig. 3.2.

To recapitulate, there is evidence that the Essence framework might be implemented in other industries besides the software development industry; hereafter, the author of the thesis considered this reference as proof of the approach adoption to HEI and business school needs. The following sub-chapter explores the possible approach application in HEI environment.

### **3.2 Essence Approach Adoption for HEI**

Essence approach was not researched in Latvia in the field of HEIs management; hence the Essence adopted methodology is developed by the author and described further aims to bring the main expected benefit as a *modus operandi* for an organization's assessment and continuous development that helps the educational institution to understand the organization systemically, develop understanding about stakeholders and their requirements, assess the system's status quo and make decisions on curricula management. Adopting the Essence technique's notation to HEI context, developed by the author, is described in the following paragraphs.

### *HEI Customer Area of Concerns and its Elements*

To describe the system initially, the seven Alphas must be defined: stakeholders, opportunity, requirements, design, work, way of working, and team. As the Essence notation prescribes understanding the Alphas as elements of an ecosystem that must be followed to succeed in the endeavor or solution development, assuming that Alphas states are changed due to activities performed by the team to implement the solution, meeting stakeholders needs, the author of the thesis determines the following elements which conditions are subject to monitoring and control for tracking the status of a whole HEI system:

**Stakeholders** are a group of people who affect or are affected by the target system and communicate the requirements for the design, give feedback to the team and ensure that the system is produced correctly. Hence the key enablers and active influencers on business education implementation are students, the employers (represented by entrepreneurs), and quality assurance authorities are also defined as Stakeholders Elements.

**Opportunity** is a set of circumstances which make it appropriate to challenge the status quo. In the context of business education, the changes in the external environment are considered by the author of the thesis as an Opportunity Element.

**Requirements** portray what the HEI must deliver to address the changes in the external environment and satisfy the stakeholders.

**System** is a higher educational institution that provides its primary value by fulfilling the stakeholders' requirements.

**Work** is the study process organized and performed by the HEI's team.

**Way-of-working** is a tailored set of practices and tools used by the team to guide and support their work; hence, the academic staff's methods, techniques, and approaches to deliver the educational content.

**Team** is a group of people actively engaged in the system's development, maintenance, delivery, or support. In the scope of the thesis, it is the academic staff of a HEI.

In outlining each area of concern for HEIs, the author assumes to define Alphas as Elements to avoid confusion and misunderstanding in the original terminology.

Continuing to describe the whole system, it is essential to mention that in the customer area of concern, the team needs to understand the stakeholders and the opportunity to be addressed; hereafter, the Customer Area deals with the Opportunity Element and Stakeholders Element. The Opportunity Element is the opportunity that articulates the reason for the creation of the new or changing the existing system. In other words, it might be understood as a set of circumstances that makes it appropriate to challenge the status quo. In the context of business education, the changes in the external environment are considered by the author of the thesis as an opportunity to challenge the existing status quo. By Essence, the Stakeholders Element is understood as a group of people who affect or are affected by the target system, they are the source of the requirements for the system, and they have to be involved throughout the endeavor to give feedback to the team and ensure that the system is produced correctly. Considering HEI or business school as the system, the author of the thesis defines students, the labor market,

represented by entrepreneurs, and authorities responsible for control over HEIs as the bodies that belong to the Stakeholders Element in the Customer Area of concern.

The following relations as prescribed in the framework for Stakeholders Element:

a) Stakeholders provide Opportunities. Due to the research results mentioned in the previous chapters of the thesis, the author identified that representatives from all stakeholder groups are interested in business school transformations responding to the changes in the external environment.

b) Stakeholders support Team. Providing regular informal and formal feedback, students, entrepreneurs, and authorities contribute to business school change and development and currently support the academic staff.

c) Stakeholders demand Requirements. The stakeholders' needs for entrepreneurial competence were communicated as the output of the two-phase research described in Chapter 2.

d) Stakeholders use the system. Representatives of students' stakeholders' groups use and consume products and services from the target system - business school. The cooperation of business and HEIs is an essential mechanism for promoting business interests, educational bodies, and society. The number of iterations between industry and the school leads to joint projects, guest lecturing, curricula adoption, trainees' programs, consulting services, and informal communications.

For the Opportunity Element, the Essence framework prescribes a single relationship - Opportunity focuses on Requirements, meaning that the Opportunity is outlined with specified requirements raised by the stakeholders; in the context of the thesis, the requirements for entrepreneurial competences are the ones that are focused by the Opportunity.

### ***HEI Solution Area of Concerns and its Elements***

In the Solution Area of concern, the working team needs to establish a common understanding of the requirements that will guide them for the system development, implementation, test, and support; hence Solution Area of concern contains two Elements: 1) Requirements Element, what the system must do to address the opportunity and satisfy the stakeholders, and 2) System Element, that provides its primary value by the fulfillment of requirements. To the previous research conducted by the author of the thesis, the demand for entrepreneurial competences and requests for disciplines developing entrepreneurial orientation articulated by students, the labor market, and policymakers. These are the requirements to be fulfilled by the target system – the HEI.

For Requirements Element, the Essence framework recommends a single relationship with the Work Element; hence the Requirements scope and constrain the Work, considering that business school curricula and study process is created and updated within the area and constraints dictated by the requirements raised by stakeholders and formed by the opportunity.

For System Element, the framework defines two types of relationships: System helps to address Opportunity, and Systems fulfills Requirements, meaning that business school provide clients with educational services adjusted to the demanded competences and close the opportunity gap caused by changes in the external environment.

### ***HEI Endeavor Area of Concerns and its Elements***

In the Endeavor area of concern, the team and its way of working must be formed, and the work must be done. The site contains three Elements: 1) Work Element – the activity involving mental or physical efforts done to meet the goals of producing a system matching the requirements and addressing the opportunity expected by the stakeholders. The study process organized and performed by the team in the business group is considered by the author of the thesis as a Work Element in the context of the paper. 2) Team Element – a group of people actively engaged in the system's development, maintenance, delivery, or support; in the scope of the thesis, the business school faculty are assumed to be the Team Element. 3) Way-of-working Element is understood as a tailored set of practices and tools used by the team to guide and support their work; hence the methods, practices, and approaches applied by the academic staff to deliver the content of the business education to its customers are assessed as a Way-of-working Element about the framework application towards business education bodies.

Essence directs the next relationship or associations for the Elements described above. There are two types of connections for Work Element: a) Work updates and changes System, and b) Work set up to address Opportunities. In the business context, this means a study process interrelates with the business school as a system. At the same time, the business education service addresses changes in the external environment.

For Team Element, Essence defines the following relationships with other Elements: a) Team creates System; b) Team plans and performs Work c) Team Applies Way-of-working; considering that business school faculty creates business school planning and executing the study process and applying agreed methodologies, guiding the educational process.

As for Way-of-Working Element, there is a single relationship with other Elements – Way-of-working guides. Work presumes that the agreed methods and standards form a methodology that regulates the study process.

### ***Visual Model Representing Systemic View of HEI***

The visual model of the HEI Improvements Elements and their relationships in the predefined areas of concern for business schools are represented in Fig. 3.5 below:

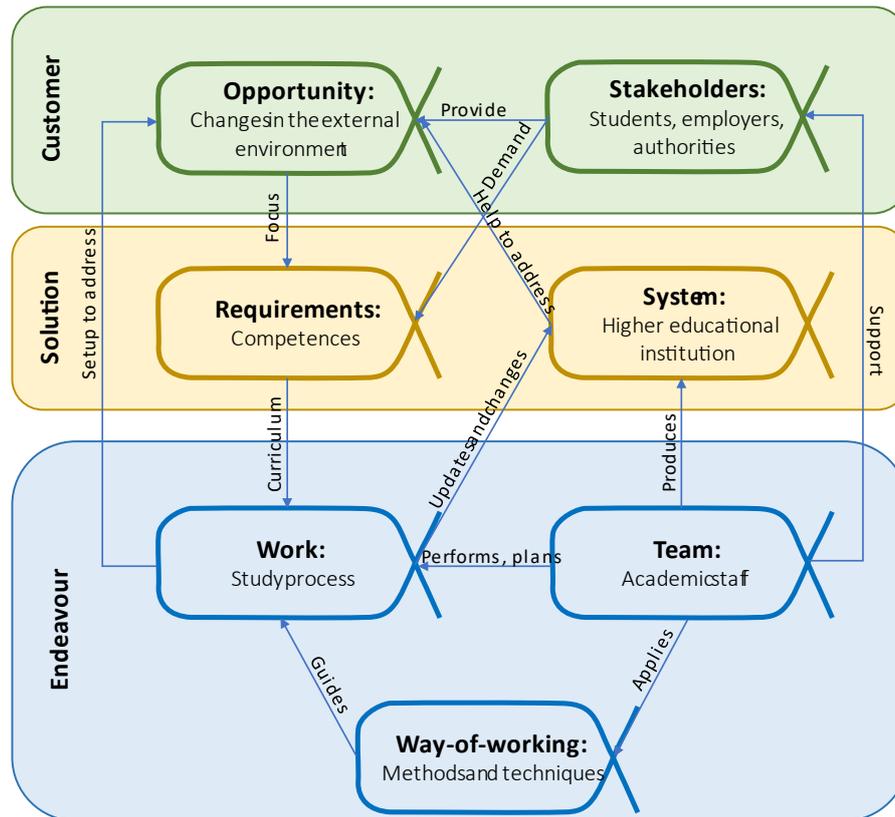


Fig. 3.5 Interrelation between the elements involved in business education improvement in HEIs (developed by the author)

### *HEI Activity Spaces*

The Essence kernel also defines a set of activity spaces that complement the Elements to provide an activity-based view of the change management process. Fig. 3.6 shows the kernel activity spaces. Definition of the activity spaces is essential as it will serve for the system's assessment, their steps identification, and outlines the actions to reach the next step in the organization's development flow. The definition is a basis for further assessment checklist development, i.e., these are fundamentals for the decision-making tool.

In the customer area of concern, the team has to understand the opportunity and involve the stakeholders acting as follows:

1. Explore Possibilities. Activity is aimed to explore the possibilities presented by the creation of the new or improved system. This includes the analysis of the opportunity to be addressed and the identification of the stakeholders. By Essence, the activity is considered completed when stakeholders are recognized and the option's value is established. As it was mentioned above, considering business school as a target system, the author of the thesis assumes that stakeholders as defined, while the value of the opportunity is not yet established – a social and business opportunity was identified in the scope of surveys and interviews conducted by the authors as well as a need to address it by the solution provided by the business school.

2. Understand Stakeholder Needs. The activity needs to engage with the stakeholders to understand their needs and ensure the correct results are produced. The activity includes

identifying and working with the stakeholders, i.e., students, entrepreneurs, and controlling authorities, to progress the opportunity. Completion criteria are the following: stakeholders agree, and the opportunity is assessed as viable. While stakeholders have a common opinion on the necessity of entrepreneurial skills development, there is no agreement that a solution can be produced quickly and cheaply to address the request for new competencies.

3. Ensure Stakeholder Satisfaction. It is required to share the results of the development work with the stakeholders to gain their acceptance of the changes in the system and verify that the opportunity, and changes in the external environment, have been successfully addressed. As completion criteria set stakeholders' satisfaction for the system release, meaning that stakeholders provide feedback on the system on behalf of their stakeholders' group and they agree to try the system; a second criterion is considered that the opportunity, changes in the external environment, requiring another competence, is addressed – a solution has been produced and is ready for the market.

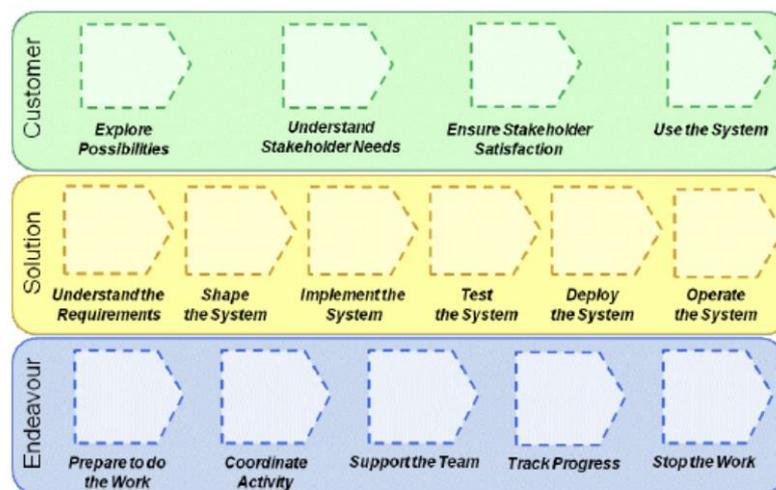


Fig. 3.6 Essence activity spaces

4. Use the System. The activity is needed to observe the use of the system in a live environment and how it benefits the stakeholders. Completion criteria for Use the System are straightforward: stakeholders are satisfied with service, meaning that using the system provides feedback on experience and confirms that the changed system meets their expectations. This could be measured by conducting the same survey and interviews described in the last part of the thesis and evaluating the same measures. The second criteria for completion of the activity are accrued benefit of the opportunity, which might be interpreted as the commercial benefits due to the solution, i.e., tangible changes in business school programs addressing the required competences. They could be measured both in financial and non-financial measures.

In the solution area of concern, the team has to develop an appropriate solution to exploit the opportunity and satisfy the stakeholders; hence the following activities are essential to perform the development by Essence:

1. Understand the Requirements. The step is recommended to establish a shared understanding of what the system to be produced must do, scope the system, and drive the development of the system. Completion criteria for the step are coherent requirements that are

understood as a consistent description of the essential characteristics of the new system. In business school, the activity should be understood as the scope of the education program, including the intra-curricular and extra-curricular actions that the team will or will not perform.

2. Shape the system. The activity is set to outline the plan so that it is possible to understand which elements need to be developed, changed, or maintained; this includes the overall design and architecting of the system to be altered or produced and identifying the critical system element. For business schools, the activity consists of program development and curricula adjustments. There are two completion criteria for the action: requirements are considered acceptable, and architecture for the system is selected, i.e., conditions describe the design from the stakeholders' perspective and provide clear value for them, while the methods, techniques, digital and network technologies, as well as fixed assets, are identified and agreed on in the educational institution.

3. Implement the System. The step is needed to adjust or build the system by implementing and integrating one or more system elements. This phase also includes system improvement. The ready system is defined as a completion criterion for the activity. Students, market representatives, and authorities accept the business school as fit for purpose and want to make it operational.

4. Test the System. The activity is chosen to verify that the system produced meets the stakeholders' requirements. Two completion criteria have to be completed before moving to the next step: in addition to the system that is ready, the conditions have to be fulfilled, i.e., no outstanding competences items are preventing the business school from being accepted as fully satisfying the requirements.

5. Make the System available for use outside. The phase is a prerequisite before the new system goes live - the tested method is open to the public and available outside the working team. The operational system is the single completion criteria for the move, considering that the business school is available for students, industry representatives, and policymakers, and they use it while the business school faculty fully supports the system to the agreed service level.

6. Operate the System. During this stage, the team supports the stakeholders using the system in the live environment. In this case, the only possible completion criteria is when the system is retired, i.e., it must be replaced, changed, or discontinued, and there are no stakeholders who still use the system.

Then in the endeavor area of concern, the team must be formed and progress the work in line with the agreed constraints and governance rules; there are five way-of-working activities in the area:

1) Prepare to do the Work. The phase sets up the team and its working environment. The working team must understand and commit to completing the work and secure funding and other resources. Essence framework recommends the following completion criteria to consider the activity as done: a) the team is seeded, that is, the team size is determined, roles and responsibilities are outlined, and the level of commitment is precise; b) for the way of working its foundation is established, meaning that critical practices and tools that form the foundation are selected, and integrated to form a useable way-of working, while the possible gaps that exist

between what is needed to execute the way-of-working and the team capability are analyzed and understood; c) the work is prepared; considering work as study process itself, the checklist for the state assessment prescribes to check the clarity of business school policies and procedures, to check academic staff members availability and readiness to start the work, as well as schedule priorities and funding to start the work.

2) Coordinate Activity. The phase is compulsory for the active execution period; its objective is to coordinate and direct the team's work. This includes day-to-day operations, including ongoing planning and re-planning of the work, re-shaping of the group, and adapting plans to reflect results and handle changes. The framework suggests two completion criteria for the stage: the group is formed, and the work is under control, considering that individuals understand their responsibilities, there are enough academic staff is recruited to enable the study process, and the team members understand how to perform their work aligned with their competencies while their tasks are consistently completed on time.

3) Support the Team. The step is needed to help the team members to help themselves, collaborate and improve their work. Completion criteria for the stage are uniting team and way of working considered as in place, the state of collaboration could be assessed by open and honest communication within the group as well as by acting as one cohesive unit, the way of working is considered in place when all academic staff has access to the practices and tools required to perform the study process, as well as involved in the adaptation and improvement the way-of-working.

4) Track Progress. The activity is necessary to measure and assess the progress made by the team; its completion criteria are measured by three inputs: a) the team is performing, meaning that academic staff consistently meet their commitments and the team continuously adapts to the changing context; b) the way of working is working well, assuming that academic staff applies practices and procedures without thinking about them; c) the work is concluded, that is results of the study process have been achieved and accepted by the students and other stakeholders.

5) Stop the Work. The last activity in the Endeavor are of concern is required to shut down the endeavor and handover of the team's responsibilities; there are three completion criteria: a) team – adjourned, meaning that academic staff's responsibilities are fulfilled, and they are available for new assignments; b) way of working – retired, considering that the methodology applied by the educational institution is no longer being used; c) work – closed, understanding that the academic staff has been released, there are no uncompleted tasks, and the budget is reconciled.

### ***HEI Set of Competencies***

The Essence kernel also prescribes a set of competencies that complement the key elements and Activity Spaces to provide a view of the critical capabilities required to carry out the work. The kernel competencies are described and shown below (Fig. 3.7). Each competency has five levels of achievement, from Assists, where an individual demonstrates a basic understanding of the knowledge, to Innovates, where already recognized experts can inspire others.



Fig. 3.7 Essence Competencies

In the customer area of concern, the team must demonstrate a clear understanding of the business and technical aspects of their domain. It can communicate the views of their stakeholders accurately. The competency is called Stakeholder Representation. It encapsulates the ability to gather, share, and balance the needs of different stakeholders (students, industry representatives, authorities, and policymakers) and accurately represent their views. People with the competency understand the business opportunity and interact with stakeholders and the implementation team; essential skills are negotiation, networking, and communication. The competency can be provided by a product manager or a group of people from the business organization; in the case of business school, program coordinators, assistants, or directors of programs usually represent the behavior.

In the solution area of concern, the team must be able to capture and analyze the requirements and build and operate the system that fulfills them. This requires the following competencies to be available to the team: 1) Analysis competency encapsulates the ability to recognize opportunities and their related stakeholder requirements and transform them into an agreed and consistent set of specifications. People with analytical competency help the team to understand and communicate the specification and visualize solutions; essential skills include agreement facilitation, the ability to separate the whole into parts and vice versa – to see the whole by looking at the requirements. The competency usually is provided by customer representatives, product owners, or analysts; in HEIs, the role is played by coordinators and directors of bachelor or MBA programs. 2) Development competency encapsulates the ability to design and build effective systems following the standards and norms agreed upon by the team and, in the case of educational institutions, aligned with the regulator’s requirements. People with the competency help the team design the system, formulate and evaluate strategies for choosing the right design, and resolve possible implementation problems. Essential skills include knowledge of technology, industry, and critical thinking. The competency might be provided by the designers or architects in the team; in educational institutions, the roles are played by senior academic staff members and directors. 3) Testing competency includes the ability to test a system, verifying that it is usable and meets the prescribed specification and design. People with the competency decide what, when, and how to test, as well as understand the quality of the solution. Essential skills contain attention to detail and an inquisitive mind; usually, the competency is provided by customers, analysts, or other stakeholders; apart from academic staff in business educational institutions, the abilities might be represented by pilot

groups of students and industry representatives who are taken on board to probe the changes in business school and provide with feedback.

In the endeavor area of concern, the team must be able to organize itself and manage its workload or study process by the chosen set of methods, in the case educational body. This requires the following competencies to be available to the team: 1) Leadership that enables a person to inspire and motivate others to achieve a successful conclusion to their work and to meet their objectives. People with the competency interact with stakeholders to report progress, re-prioritize tasks, and ensure that team members are good in their assignments. Essential skills required are negotiation, communication, and decision-making. Usually, leadership is demonstrated by the most experienced team member or a dedicated change project manager; hence program directors are generally the ones who act as business school leaders; 2) Management proficiency captures the ability to coordinate, plan and track the work done by the team. Management must organize and plan activities and account for time and money spent. Essential skills include administration, resource planning, and financial reporting. Usually, the competency is provided by the project manager or the team members themselves, while in business schools, the skills are provided by administration and teaching staff.

### ***HEI Elements State Checklists***

The Essence framework provides a tool to help assess the state and progress of the key elements through the whole change management or system update process. The notation recommends using a rectangle with rounded corners containing the name of the State to visualize a State, as in Fig. 3.8 below.

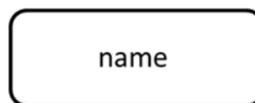


Fig. 3.8 State

A State Successor association is visualized by a solid line with an open arrowhead connecting a State with its successor State. The line may consist of one or more connected segments, as in the example in Fig. 3.9 below:

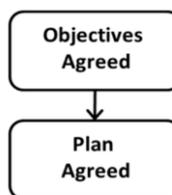


Fig. 3.9 State successor

The state checklist for Stakeholders Element is developed per Essence standards, considering the industry setting. As was mentioned earlier, stakeholders are a group of people

who affect or are affected by the target system, i.e., students, entrepreneurs, and authorities. States development required assessment by the six possible conditions for the Element:

- 1) Recognized. The state is confirmed if
  - a. stakeholders are known.
  - b. key stakeholder groups represented;
  - c. Stakeholders' responsibilities are defined.
- 2) Represented. The state is verified if
  - a. their responsibilities agreed;
  - b. representatives authorized;
  - c. collaboration approach is agreed upon;
  - d. way of working is transparent.
- 3) Involved. It is justified when
  - a. representatives assist the team;
  - b. they provide timely feedback;
  - c. changes are communicated swiftly.
- 4) In Agreement. The state is actual when
  - a. minimal expectations of the parties are agreed upon;
  - b. representatives are satisfied with their involvement;
  - c. representatives' input is valued;
  - d. teams input valued;
  - e. priorities are clear.
- 5) Satisfied for Deployment. The state is approved if
  - a. stakeholder provide feedback;
  - b. the system is ready for market.
- 6) Satisfied in Use. The state is correct when
  - a. stakeholders' feedback on the system use is available;
  - b. system meets expectations.

The Stakeholders' progress during the development and improvement of the system is represented through several state changes in Fig. 7 Stakeholders states succession in Appendix.

Opportunity in the Essence framework is understood as a set of circumstances that makes it appropriate to develop or change the system. The opportunity articulates the reason for creating the new or changed system, represents the team's understanding of the stakeholders' needs, and shapes the requirements. State Checklist for Opportunity helps to assess the overall progress and health of the Element; the following seven states are included in the checklist:

- 1) Identified. The state is correct when
  - a. the idea behind opportunity is identified;
  - b. stakeholders are ready to invest.
- 2) Solution needed. The state is verified when
  - a. the solution is identified,
  - b. stakeholders' needs are precise for the team,
  - c. at least one answer is proposed.
- 3) Value established. The state is justified if

- c. the opportunity value is measurable.
  - d. success criteria are clear;
  - e. outcomes of the initiative are clear and quantified.
- 4) Viable. The state of Opportunity is actual if
- a. the solution is outlined and possible within constraints;
  - b. the solution is profitable;
  - c. risks are manageable.
- 5) Addressed. The condition is verified when
- a. opportunity is addressed;
  - b. solution worth deploying;
  - c. stakeholders are satisfied.
- 6) Benefit accrued. The position is correct when
- a. solutions accrued benefits ;
  - b. ROI is acceptable.

During the development of the system, the Opportunity evolves through the number of states, presented in Fig. 8 Opportunity states succession in the Appendix, from the first outline of the idea to the accrual benefit from using it.

The solution area of concern includes everything with Element Requirements and Element System. Requirements describe what the system must do to satisfy stakeholders addressing the opportunity. The following checklist, including six conditions that could assess the progress of the Requirements, states:

- 1) Conceived. The shape is verified when
  - a. users of the system are identified,
  - b. funding is identified,
  - c. opportunity is clear.
- 2) Bounded. The condition of Requirements is correct if
  - a. requirements management is in place,
  - b. boundaries are clear,
  - c. requirements' format is clear.
- 3) Coherent. Position of Requirements Element is considered coherent when
  - a. requirements between stakeholders and the implementation team are shared,
  - b. critical usage scenarios are explained,
  - c. priorities clear,
  - d. the team knows and agrees on delivery.
- 4) Acceptable. The state is confirmed when
  - a. changes are under control,
  - b. acceptable solutions are outlined;
  - c. clear how opportunity is addressed.
- 5) Addressed. The condition is verified if
  - a. requirements and system are matched;
  - b. system worth making operational.
- 6) Fulfilled. The state is verified when

- a. stakeholders accept requirements,
- b. requirements are fully satisfied by the system.

The state's progress is visualized in Fig. 9 Requirements states succession in Appendix.

A system in software development usually is understood as a combination of software, hardware, and data, that create value by execution of software, while in social science, a system is understood as a complex arrangement of elements, including individuals, and their beliefs, as they relate to a whole. Out of the software development context, the system also might be defined as the interrelation of interdependent objects functioning as a whole that can be a part of a more extensive system, business, or social solution. The progress of System Element could be described by the following six states, applying the criteria in the checklist:

- 1) Structure selected. The state of the System is valid when
  - a. Technologies and methods are chosen,
  - b. decision on system organization is made,
  - c. critical technical and organizational risks are agreed to
- 2) Demonstrable. The condition is verified if
  - a. The system is ready for demonstration
  - b. performance is measured;
  - c. integration with the environment is demonstrated;
  - d. critical elements are shown.
- 3) Usable. The state is correct when
  - a. The system can be operated;
  - b. system performance is acceptable,
  - c. added value is clear.
- 4) Ready. The form is proper if
  - a. documentation is available,
  - b. stakeholders are interested in the system,
  - c. operational support is in place.
- 5) Operational. The condition is confirmed if
  - a. The system is available for use,
  - b. The system is live,
  - c. agreed service level is available for clients.
- 6) Retired. System Element is evaluated as retired when
  - a. Changes and updates are stopped,
  - b. The sponsor and the team no longer support the system,
  - c. The system is replaced or discontinued.

Progress of the System states described above is indicated in Fig. 10 System states succession in Appendix.

By Essence, the Endeavor Area of Concern includes everything to do with the team and their way of work; the area consists of Elements of Team, Work, and Way-of-working. A team is a group of people occupied with the development and update of the system. The team's evolvment during their time together and progress through the five states of the Team Element could be assessed by applying the following checklist:

- 1) Seeded. The state of a team is verified if
  - a. responsibilities are outlined,
  - b. required competencies are identified,
  - c. governance rules defined.
- 2) Formed. The state of a team is correct when
  - a. enough members are recruited,
  - b. their roles are understood,
  - c. members are introduced to each other,
  - d. team members commit to the team.
- 3) Collaborating. The condition for Team Element is estimated when
  - a. The team works as one unit,
  - b. People communicate open and honest,
  - c. Team members know each other,
  - d. People trust each other.
- 4) Performing. The state of the Team is defined if
  - a. The team regularly meets commitments and adapts to change,
  - b. Team members do not ignore and address problems,
  - c. The team works on continuous improvement, i.e., rework is minimized,
  - d. waste is continuously decreased.
- 5) Adjourned. The final state of the Team Element is correct when
  - e. All responsibilities are fulfilled,
  - f. The mission is completed,
  - g. team members are ready to leave for another team.

Fig. 11 Team states succession in Appendix shows a visualization of the state's progress.

In the framework, work involves efforts to achieve results; work is the team's activities to create a solution meeting requirements and addressing opportunities. The work is regulated by the practices that shape the team's way of working, and their ability to coordinate, organize, estimate, and share their work impacts their commitments and delivery value to stakeholders. Many agile practices can be used to manage the work, including Scrum, Kanban, Task Boards, etc. progresses through the six stages suggested for the Element:

- 1) Initiated. The state for the Work Element is correct when
  - a. The required result is clear;
  - b. source of funding is clear;
  - c. constraints are clear.
- 2) Prepared. The condition of work is verified if
  - a. acceptance criteria for the work done are established;
  - b. tasks to perform the work are identified and prioritized;
  - c. team members are ready;
- 3) Started. The state is specified when
  - a. progress of work is monitored;
  - b. tasks are being processed
  - c. definition of done is in place.

- 4) Under control. Work state is defined as under control when
  - a. tasks are being completed;
  - b. progress is measured;
  - c. commitments are regularly met.
- 5) Concluded. The state of Work is estimated as completed when
  - a. results are achieved;
  - b. only administrative tasks left,
  - c. stakeholders have accepted the results.
- 6) Closed. The final form is confirmed when
  - a. the team discovers the lessons to learn for future endeavors,
  - b. there are no uncompleted tasks,
  - c. the team is released.

Fig. 12 Work states succession in the Appendix below shows the progress via several stages.

Way-of-Working is a dedicated set of tools and practices used by the team to execute their work. During the endeavor, the way of working develops through six state changes as described further:

- 7) Principles established. The state of Way-of-Working is defined when
  - a. practice and tool constraints are known;
  - b. the team supports principles,
  - c. tool needs are agreed upon.
- 8) Foundation established. The condition for Way-of-working is defined if
  - a. critical practices and tools are selected;
  - b. rules need to start work are agreed upon;
  - c. gaps in capability are understood;
  - d. non-negotiable methods and tools are identified.
- 9) In use. The state is correct when
  - a. methods and tools are in use and supported by the team;
  - b. techniques are adapted to the context;
  - c. the tools are regularly inspected;
  - d. methods and tools help collaboration.
- 10) In place. The state is estimated if
  - a. the whole team uses methods and tools;
  - e. working well;
  - f. predictable progress is being made;
  - g. tools support a way of working;
  - h. instruments are tuned by the group regularly.
- 11) Retired. The final state of Way-of-Working is defined when
  - a. devices are no longer in use;
  - b. lessons learned are shared within the group.

The progress via the several state changes is visualized and presented in Fig. 13 Way-of-working states succession in the Appendix below.

Therefore, the framework for the methodology for assessing the output of a HEI provides insight into the assessment process that is following:

1. Estimating each Element's state (each element of the System) at the initial stage of the assessment process is a mandatory step in establishing a holistic view of the system.
2. The holistic view develops over time as Element states change; hence the progress is a subject for the states changes review and control.
3. Elements help to track the system status and plan the following steps on the individual, team, and organizational levels.

The following sub-chapter presents the methods and materials that are integral parts of the methodology for assessing whether a business education provided by a HEI meets stakeholders' requirements.

### **3.3 Elaboration of Methodology for Assessment of Business Education Implementation**

The elaborated methodology is a set of questionnaires and other materials developed within the methodology's framework for assessing whether the output of business education HEI meets their stakeholders' requirements. The methodology covers the whole cycle of its implementation. The assessment of whether the production of business education HEI meets stakeholders' needs consists of nine steps. The process flow is described below.

#### **Step 1. Apply Essence Checklists for BS to assess the status quo**

The assessment process begins with applying Essence checklists for a business educational institution to determine its *status quo*. The appointed faculty members evaluate the task on a regular basis, i.e annually. The stakeholders' group to be addressed is the HEI's faculty. There is no strict recommendation for the process start time.

Determining of the overall state of the business education implementation is the sum of the definitions of the Elements states. The assessment is done by applying the checkpoints associated with each form of the respective state graphs, and the state is determined to be the most advanced in the state graph consistent with the currently met checkpoints. The Elements capture the key concepts involved in the process, allow the progress and health of the endeavor to be tracked and assessed, and provide the common ground for methods and practices. The Elements have a set of pre-defined states to determine progress and health. Element States are aimed to track Element's status and might be checked with control questions shaped as checklists. The element's state is considered granted if all statements in the checklist state are positive. As soon as there is at least one negative statement, this is a trigger to stop and assign the form to the Element. The Elements for assessment are the following:

- Element 1. Stakeholders: Students, businesses, and other interested bodies
- Element 2. Opportunity: Changes in external environment
- Element 3. System: Business School
- Element 4. Requirements: Competences
- Element 5. The team: Academic Staff

Element 6. Work: Study process

Element 7. Way-of-working: Methodology

The academic staff members are asked to analyze the statuses of the Elements and choose the one most closely describing the Element status proposed in the questionnaire and checklist that are relevant to the discussed Element. The example of a supporting tool, a checklist, for Element 1 is presented in Table 3.1 below, while the other clarifying mechanisms are shown in Table 30, Table 31, Table 32, Table 33, Table 34, and Table 35 in Appendix.

Table 3.1

Checklist for Stakeholders' Element

<b>Element 1</b>	<b>State</b>	<b>Checklist</b>	<b>Y/N</b>
Stakeholders: students, business, and other interested bodies	Recognized	Stakeholders' groups identified.	
		Key stakeholders' groups identified (e.g., students, industry representatives, accreditation authorities).	
		Responsibilities of stakeholder representatives are defined.	
	Represented	Representatives from students (e.g. Students Committee).	
		Entrepreneurs (e.g. Advisory board).	
		Authorities have been appointed.	
		Their responsibilities are agreed.	
		Collaboration approach is agreed.	
	Involved	Representatives from students, entrepreneurs, and authorities assist the academic staff with their responsibilities.	
		They provide with team with feedback and participate in decision making.	
		They communicate on changes in their stakeholders' group.	
	In agreement	Stakeholders' representatives agreed on their minimal expectations for the changes in system.	
		Students, entrepreneurs, and authorities' representatives are positive about their involvement in the work.	
		Students, entrepreneurs, and authorities' representatives agreed with how their priorities are balanced.	
	Satisfied with implementation	The stakeholder representatives confirm that they agree that changes in business school are ready for use.	

Element 1	State	Checklist	Y/N
	Satisfied with use	Stakeholders are using the new system and providing feedback on their experiences (students apply for courses, industry reps launch new initiatives with BS, authorities approve accreditation papers).	
		The stakeholders confirm that the new system meets their expectations (formal and informal feedback).	

The determination of Element instance states can happen at any point since evaluating the checkpoints is a manual activity. When checkpoints are considered, the result can be that an Element instance regresses, and its current state is set back to some earlier form of its lifecycle. Once the overall condition of the business education implementation is determined, the output can be used to generate advice on how to proceed. This can be understood as a guidance which takes a set of pairs of Element instances and target State and returns a set of newly discovered Activities: a “to-do” list to be performed by the team. The essential idea is to assemble the to-do list by exploring each Element instance and finding those activities with the Element instance’s target state among its completion criteria.

**Step 2. Conduct a 7-questions online survey to measure Individual Entrepreneurial Orientation in the target students’ group**

The next step in the assessment is conducting a 7-questions online survey to measure Individual Entrepreneurial Orientation in the target students’ group. A academic staff member who is appointed for the task conduct the evaluation. The stakeholders' group to be addressed is the HEI students. Recommended frequency is annual.

Policymakers consider entrepreneurship development as one of the critical success factors for future employability. Individual Entrepreneurial Orientation (IEO) Index was developed by the author developed Individual Entrepreneurial Orientation (IEO) Index to evaluate the entrepreneurial competence of students doing their major in business to meet market needs. IEO Index is focused on the measurement of students’ innovativeness and creativity, proactiveness, and risk-taking self-assessment. The indicator is recommended for monitoring and control on an annual basis as a measure for quality evaluation of the educational services provided to the students (who act as clients in this case). It is suggested to include in the sample students from different groups; then academic staff members inquire about students anonymously using the questionnaire displayed in Table 3.2 below.

Table 3.2

## 7-questions survey

<b>IEO Index Components</b>	<b>1</b> <b>“Strongly disagree”</b>	<b>2</b> <b>“Disagree”</b>	<b>3</b> <b>“Neutral”</b>	<b>4</b> <b>“Agree”</b>	<b>5</b> <b>“Definitely agree”</b>
Among your friends, you are the person who uses new products, applications, programs, services					
You prefer a strong emphasis in projects on unique, one-of-a kind approaches, rather than revisiting tried and true approaches used before.					
When you learn new things, you prefer to try your own unique way than to act like everyone else.					
You prefer experimenting and an original approach to problem-solving instead of using methods that others use to solve problems.					
You like to make bold decisions, even going into unknown actions.					
In the situation of the need to decide, with high uncertainty of its result, you take a bold and aggressive attitude to maximize the probability of using potential opportunities					
You usually act in anticipation of future problems, needs or changes					

**Step 3. Conduct an online survey to identify competences that are prioritized by academic staff**

The next step in the assessment is conducting an online survey to identify competences prioritized by academic staff. The appointed academic staff members conduct the evaluation for the task. The stakeholders' group to be addressed is the HEI's academic staff members. Recommended frequency is annual.

The competence list is derived from the Entrepreneurial and Managerial competences list, created by Nikitina and Lapiņa (2019). Academic staff experts evaluate the importance of the competence listed in the questionnaire below. The output values are calculated as weighted values, and then the most demanded competencies are the top 3 with the highest weighted rank from the list. The lowest demanded competences, the top 3 with the lowest weighted grade from

the list, are identified, and the input for Step 6 is ready. The recommended list for the questionnaire is presented in the Table 36 in Appendix.

#### **Step 4. Conduct an online survey to Identify prioritized competences for business**

The next step in the assessment is conducting an online survey to identify competences prioritized by the Alumni Committee, Alumni Association, or Employers Association. The evaluation is conducted by the appointed academic staff members for the task. The stakeholders' group to be addressed is the HEI's alumni and business representatives. Recommended frequency of the activity is annual.

Alumni Committee members and business representatives are inquired to identify business stakeholders' priorities and demand for the competences required by the market. As soon as weighted values are calculated, the input for Step 6 is ready. The recommended list for the questionnaire is presented in the Table 36 in Appendix.

#### **Step 5. Conduct an online survey to identify prioritized competences for students**

The next step in the assessment is the conduction of an online survey to identify competences that the students prioritize. The evaluation is conducted by the appointed academic staff members for the task. The stakeholders' group to be addressed is the HEI's Students Union or a Students Committee as representatives of the students' stakeholder group. Recommended frequency of the activity is annual.

Students Union members as representatives and opinion leaders from the students' stakeholders' group are inquired to identify their priorities and expectations for the competences required for future employability. As soon as weighted values are calculated, the input for Step 6 is ready. The recommended list for the questionnaire is presented in the Table 36 in Appendix.

#### **Step 6. Aggregate weighted prioritized competences**

Weighted values collected from all the stakeholders' groups are accumulated for comparison and are considered a subject for review, discussions, and brainstorming by the academic staff and its key stakeholders. The output of the sessions is regarded as input for Step 7.

#### **Step 7. Make adjustments in syllabus, educational and operational programs if necessary**

Considering previous findings, academic staff applies changes in the educational program or objectives of the courses integrated into the program and extra-curricular activities.

#### **Step 8. Go to Step 1**

The seven-step procedure is recommended for application annually.

The methodology elaborated for assessing whether the output of a business educational institution meets its stakeholders' requirements was tested in the year 2022 from April to June

in six HEIs in Latvia and Poland. The following sub-chapter reports on the result of the validation of the methodology.

### **3.4 Validation of the Methodology for Assessment of Business Education Implementation**

The methodology for assessing whether the output of a business educational institution meets its stakeholders' requirements was tested from April to June 2022 in six HEIs in Latvia and Poland. The methodology was proposed for review and evaluation by the executives and decision-makers in the HEIs. The HEIs executives were asked to judge the proposed procedure, identify its strengths and areas for further development and improvement, and determine whether the proposal is relevant for application in their HEI. Their judgments were collected during a session of unstructured interviews conducted in the form of remote ( $n = 5$ ) and on-site ( $n = 1$ ) meetings of up to 60 minutes each. The methodology is described in sub-chapters 3.2 and 3.3. was introduced to the experts in the form of a codified description including introduction text, tables, and visual diagram prior to the interview. The summary of the discussions, experts' judgments, and recommendations are presented in Table 37 in Appendix.

In addition to the interviews, for the HEIs based on the students' feedback was calculated the IEO Index. The lowest IEO Index was equal to 3.09 ( $n = 14$ ), and the highest value for the IEO Index was equal to 3.75. The highest value was calculated based on samples of two different institutions ( $n = 26$ ;  $n = 46$ ). It is worth mentioning that the IEO Index results are indicative as the sample sizes were smaller than 50 respondents in all institutions.

The results of the assessment meetings demonstrate that the experts were satisfied with the proposed methodology and are interested in the IEO Index value. The experts have a signed agreement that the proposed process might be considered one of the possible practices to develop and support continuous improvement in HEI organizations and to conduct a self-assessment quality assurance audit of the educational services provided by a business educational institution. They also agreed that the outputs of the self-assessment give a holistic view of the system. Many experts emphasized the different stakeholders' involvement in the evaluation process as an essential strength of the proposed model. The experts noted that the proposed design might be a cornerstone to starting an HEI transformation process to challenge the status quo and evolve the organization. Additionally, they mentioned that the technique is a ready-to-use tool for experimentation, feasible for implementation, and might be recommended for commercial applications. The experts said that the ideas that are the basis of the methodology go in line with the LR and EU authorities' requirements and recommendations and might be valuable in the context of the HEI accreditation process.

#### ***Evaluation of the outcomes of experts' interviews***

In addition, the experts provided recommendations and instructions for consideration for the improvement of the proposed approach and methodology. The author groups these items as the ones that positively impact the methodology and the ones that have neutral effects. The

overview of the recommendations that are considered to impact the model positively and are valuable for incorporation in the proposed methodology is presented in Table 3.3 below.

Table 3.3

Recommendations received from experts

Item #	Experts	Received recommendation	Process Flow
1.	Expert 2	To develop a simplified process representation in the form of a diagram.	Step 0
2.	Expert 4	To include check on premises, building, meetings with employers, etc. in the checklist for the HEI (Element 3).	Step 1
3.	Expert 4	To include the control of the annual performance appraisal reviews with employees in the checklist for the Academic staff (Element 5).	Step 1
4.	Expert 4	To include the control of students' support in the checklist for the Business School (Element 3).	Step 1
5.	Expert 3, Expert 5	To consider the right moment at which a single cycle of the self-evaluation process must be started and ended.	Steps 1, 8
6.	Expert 3	To define the optimal number of representatives of the stakeholders to avoid potential conflict of interests.	Steps 3, 4, 5
7.	Expert 3, Expert 5	To re-group competences that have close meaning and update their wording.	Steps 3, 4, 5
8.	Expert 3	To include Legal Literacy in the list of competences.	Steps 3, 4, 5
9.	Expert 1, Expert 4	To include employers' perspectives in the assessment as well as one of the major stakeholders.	Steps 4
10.	Expert 5, Expert 6	To validate the findings of competences assessment with the requirements and recommendations that are provided by the regulator (e.g. Ministry of Science and Higher Education (Poland) and Ministry of Education and Science (Latvia)).	Step 6

The author concluded that the changes in the proposed methodology would have the following impact:

Item 1 (“Visual representation of the process flow”), the visual representation of the recommended process significantly improves communication of the described above process flow. Hence the diagram has to be included in the methodology. The process diagram is presented in the Fig. 3.10 below.

Items 2, 3, and 4 (“Update checklists with extra controls”), the approbation process is precious for testing the methodology, and these items are an example of the supporting facts as new elements that bring added value for academic staff are

highlighted during interviews; three Elements checklists are updated accordingly and might be found in Table 31 and Table 33 in Appendix.

Item 5 (“Frequency of the cycle”) challenges the initially proposed annual frequency for the assessment and overall workload caused by the organization’s implementation of the assessment methodology.

Revising the interview scripts, the author concluded that the repetition of the entire cycle of assessment, including eight steps, is a flexible variable defined by an assessed HEI according to their needs or might be aligned with HEI’s accreditation timeline. The change in methodology is represented in the diagram of the process flow in the Fig. 3.10 below.

Experts emphasized the significance of effective resource allocation for methodology implementation if a complete assessment cycle consisting of eight steps is a resource-intensive process. Taking the flexibility of the frequency variability above, the author proposes to conduct monitoring of the IEO Index, which is a key performance indicator, on a semi-annual basis, at the end and the beginning of the academic year, supposing the Step 2 as the more frequent activity that provides output for the academic staff’s decision-makers. The change in methodology is represented in the diagram of the process flow in the Fig. 3.10 below.

Item 6 (“Optimal number of stakeholders representatives”) explores the technical requirements for the methodology application. To avoid potential disbalance of the gathered data quality during Steps 3, 4, and 5 and the extra step aimed to collect the employers’ opinion, the author recommends conducting the competencies evaluation within the representative groups that are similar in size but not less than five. The change in methodology is represented in the diagram of the process flow in the Fig. 3.10 below.

Items 7 and 8 (“Re-group the competences in the list” and “Additional competence”), even though the recommended competences list is not assumed by the author as ultimate and is considered open for updates by the HEI’s needs, it was decided to re-group the ones that were proposed to improve the readability of the list. The changed list incorporated in the methodology is represented in the Table 38 in Appendix.

Item 9 (“Employers as stakeholders”) is considered by the author as a crucial improvement for the methodology. Assuming alumni as a group representing actual employers’ opinions, the author believes that the group must be extended with the enterprises offering the opportunities for students’ practices or professional organizations that might be involved in the assessment process conducted by HEI. Experts noted that the representatives of alumni and employers often overlapped in this context; however, the author believes that one more step has to be added to the process flow to avoid possible misinterpretation of the Stakeholders Element. The change in methodology is represented in the diagram of the process flow in the Fig. 3.10 below.

Item 10 (“Regulator’s requirements”), even though the author considered the actual LR requirements in the scope of the research, it has to be taken into account that

the legal acts issued by authorized government bodies are subject to change. Hereafter the author prescribes to the academic staff members in charge of the HEI assessment application to revise the actual normative acts and compare the findings that result from the previous steps. The change is incorporated into the methodology and is represented in the process flow in the Fig. 3.10 below.

Analyzing the results of the expert’s responses, the author evaluated some recommendations as having a neutral impact on the proposed methodology or low priority for immediate implementation; a summary of the items developed by the author is presented in the Table 3.4 below.

Table 3.4

Recommendations received from experts

Items #	Experts	Received recommendation	Process Flow
1.	Expert 2	The diagram representing the adaptation of the Essence framework-based model has to be more transparent.	Step 0
2.	Expert 1	Describe the roles which are required for successful implementation of the methodology and define their responsibilities.	Step 1
3.	Expert 2	Exchange the ‘customer’ term to ‘beneficiary’.	Step 1
4.	Expert 4	Update Elements checklists with numeric values.	Step 1
5.	Expert 6	1st year students could be biased about their abilities.	Step 2
6.	Expert 1	Parents are an important referent group.	Steps 3, 4, 5
7.	Expert 4	Alumni (or any other stakeholders) could be biased.	Steps 3, 4, 5

The author’s explanation for the reasoning is as follows:

- Items 1, 2, and 3 correspond to the Essence standard's core elements used as a basis for adapted model development. Item 1 (“Essence framework-based model is not clear enough”) from the list could be eased with the introduction of a simplified visual process mentioned in the section above. Item 2 (“Roles and responsibilities are not described”) is out of scope for the process as it is assumed that the Academic staff, as a leading actor in the process, is in charge of the procedure. The form of the working group is not defined as it depends on the HEI. Item 3 (“Change ‘customer’ term”): semantically, both terms have very close meanings, the author decided to remain: semantically, both times have very close meanings, so the author chose to keep the original word from the standard.
- Item 4 (“Numeric values in Elements’ checklists”) is considered by the author as relevant in case the step in the process flow is automated.
- Items 5 (‘1<sup>st</sup>-year students’ biased opinion’) and Item 7 (“Alumni’s opinion could be biased”) are leveled by opinions from other stakeholder groups.

- Item 6 (“Parents as important referent group”), even though studies report that parental involvement in a child’s learning process is among the critical factors for the child’s success in the school. Most parents wish to be treated as essential stakeholders in higher education (Wood & Su, 2019); the author assumes that the interests of the group are presented by other stakeholders’ groups – “Employers,” as the proposed methodology is aimed to address not individuals, but the whole group of students.

***Process flow diagram describing the proposed methodology***

Analyzing the outcomes of the expert’s interviews, the author adjusted the proposed methodology by assessing the impact explained above. The visual representation of the updated procedure for evaluation of the output of business education versus stakeholders’ requirements is presented in the Fig. 3.10 three assumptions have to be taken into account for the methodology application:

- The assessment cycle’s repetition, start, and end time are variables that HEI defines by their needs.
- Conduct monitoring of the IEO Index (Step 2) on a semi-annual basis at the end and the beginning of the academic year, supposing the more frequent activity that provides output for the academic staff’s decision-makers. For this case, it is suggested to apply the monitoring tool to the same sample of students. HEI defines the selection.
- Conduct the competences evaluation (Steps 3, 4, 5, and 6) within the representative groups that are similar in size but not less than five.

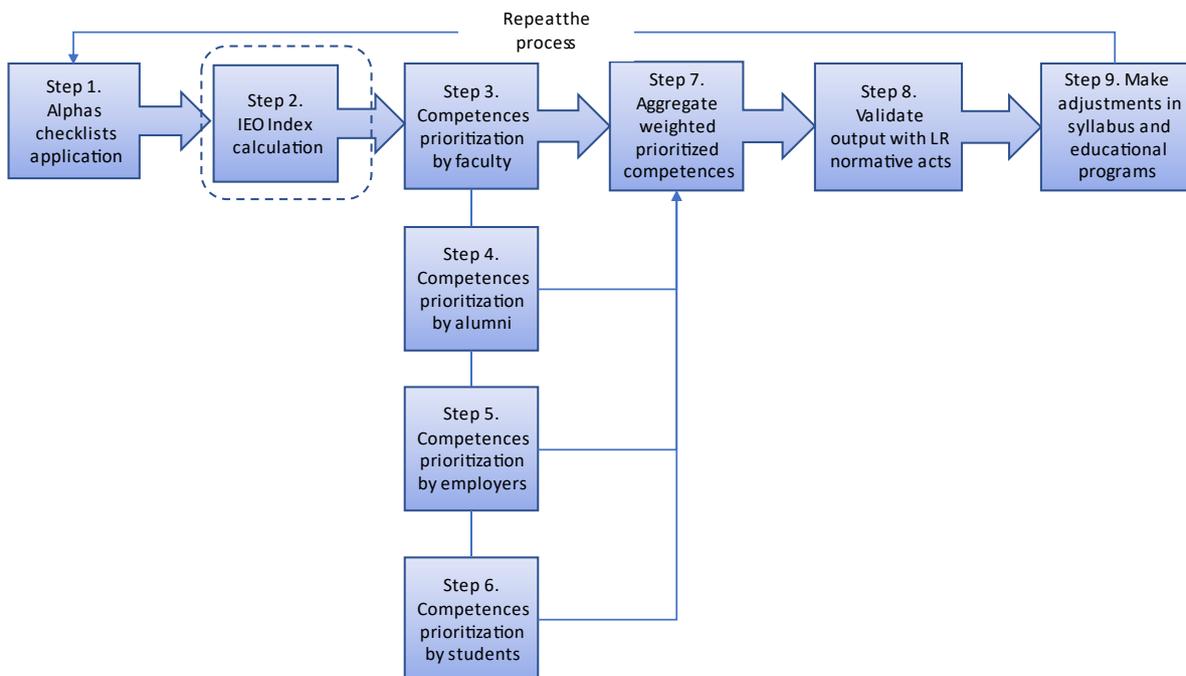


Fig. 3.10 Evaluation Procedure’s Process Flow

Thus, the analysis of the interviews with HEI industry experts revealed the strengths and areas for critical review and further revisiting of the proposed methodology for assessment of the output of the business education provided by HEI versus stakeholders' requirements. The yield of the analysis led to the improvement of the approach.

Fig. 3.11 presents the conceptual model of the 3<sup>rd</sup> concluding phase of the research. Answering to Research question 3: "What elements are essential to develop a systemic view and provide HEI with a decision-making tool to improve business education?" the author of the Thesis explored different theoretical and practical aspects of agile tools for system evaluation and decision making (research task 7). Essence framework was chosen as a decision-making framework, and it was adopted to application for business education improvement in HEIs; hence a Model of Interrelation between the elements involved in business education improvement in HEIs was developed (novelty 5) including IEO Monitoring and assessment methodology (novelty 6). Interviews with HEIs experts to pilot and validate the proposed methodology and draw the relevant conclusions were conducted to validate the proposed methodology (research task 8).

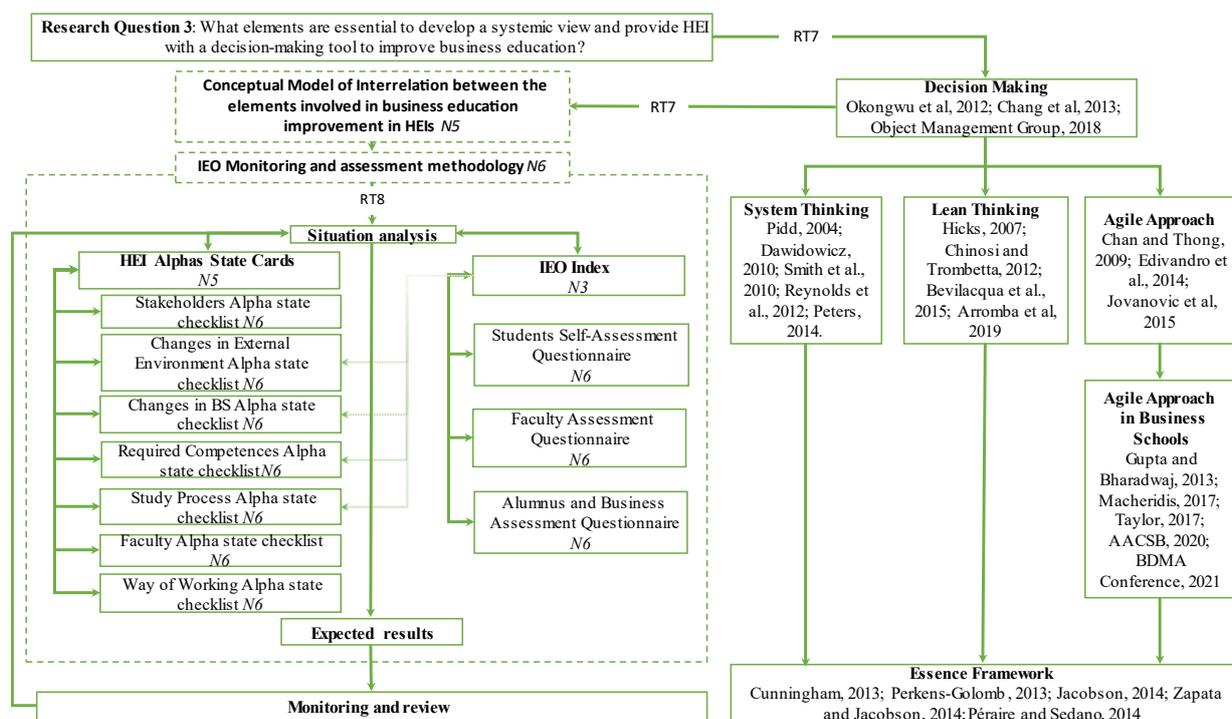


Fig. 3.11 Conceptual model of the 3<sup>rd</sup> phase of the research, detailed version (created by author)

Note: RT7 = research task 7, RT8 = research task 8, N5 = novelty 5, N6 = novelty 6.

## Conclusion

Chapter 3 presents the methodology for assessing whether the output of a business education provided by HEI meets its stakeholders' requirements. The methodology developed in the course of the research gives both theoretical comprehension of the possibility of assessing

the output of a HEI in the context of stakeholders' expectations and proposes a practical tool that allows HEI to plan the following steps on the individual, team, and organizational level.

The methodology for assessing whether the output of a HEI meets its stakeholders' requirements is assumed as a methodology for continuous improvement that addresses the gap in traditional HEI assessments that are based on the evaluation of specific courses, not students' competence. The approach presents a set of techniques and materials developed for assessing whether the output of a HEI meets its stakeholders' requirements in short-term and long-term perspectives and tracks key performance indicators that can be affected in the continuous improvement of the HEI.

## CONCLUSIONS AND RECOMMENDATIONS

The following conclusions were drawn resulting from the review of scientific literature and the empirical research, confirming the hypothesis put forward in the Thesis:

1. Exploring the background of **business education** and its latest trends within the last decades, it is possible to conclude that there has been a significant **transformation** in the teaching methods, the role of partnership and networking for HEIs, and the approach toward curricula updates due to the needs of external stakeholders. The transformations led to **competence-based education** where the required competence is a dominant precondition for the business education industry.
2. Taking into account the EU statistics, it is possible to conclude that in the European Union, education in business, entrepreneurship, and administration across the EU-27, is considered the largest field of study, and the number of students enrolled in tertiary education remained relatively stable within the last decade which explains the topicality of the research.
3. Given the results of the research, it is possible to conclude that the **competencies can be acquired** in three ways: as innate competence or acquired by experience and education.
4. Based on the research, the **core competencies** for employability demanded by the labor market are an intersection of managerial and entrepreneurial competencies, such as **creativity, risk-taking, and proactiveness**. Hence, the author considers creativity and innovativeness, risk-taking, and proactiveness as pillars for composing the **Individual Entrepreneurial Orientation (IEO)** and IEO Index which can be applied as a measuring instrument in business education to evaluate students' entrepreneurial competence level.
5. Given the results of the importance and performance analysis based on external and internal stakeholders' data collected in Finland, Latvia, and the Netherlands, it is concluded that entrepreneurial competence is **essential for employability**. However, the perception of its importance is varied among different stakeholders' groups.
6. Given the results of the **IEO research** conducted in Bulgaria, Latvia, Lithuania, Poland, and Ukraine, it is possible to conclude that the IEO Index and its components are varied across the researched countries and are impacted by HEIs.
7. Considering the results of the cross-country IEO research, it was concluded that **business education students did not demonstrate** expected higher values in Individual Entrepreneurial Orientation compared to STEM undergraduates, which is evidence that **business education demands an approach** to advance its output and meet the needs of external stakeholders.
8. Given the exploration of agile methods for systems evaluation and cross-industry benchmarks, **the HEI Essence Improvement conceptual model**, worked out by the author, is recognized as an integrated model for decision making that provides a

framework to describe the HEI system with the interplay of its Elements including Stakeholders, Changes in External Environment, the HEI, Competences, the Academic Staff, the Study process, and Methodology.

9. The **methodology for assessing the output of business education** in accordance with stakeholders' requirements can be applied to measure the level of entrepreneurial orientation of students in HEI and assess its actual status from the continuous improvement perspective and define requirements of the different stakeholders' groups that have to be taken into account.
10. Given the results of the methodology approbation, the **assessment cycle's repetition, start, and end time are variables** which HEI defines according to their needs.
11. Considering the entire cycle of assessment as labor-intensive, it is possible to use the minimally **viable version of the methodology's** application in the form of the **single IEO Index monitoring** on a semi-annual basis at the end and the beginning of the academic year, supposing that a more frequent activity provides prompt output for the academic staff decision-makers.
12. Given the results of the methodology validation, it is possible to conclude that the questionnaires for HEI's assessment and requirements definition, which are **supporting part of the methodology** for assessing the output of business education, **can be updated and extended by the stakeholders' groups** involved in the HEI's assessment in accordance with their specific needs.

Considering the results of the research, the author has developed the following **recommendations** which have been divided into 3 parts: 1) for higher educational institutions; 2) for entrepreneurs; and 3) for students.

#### ***For HEIs***

To apply the methodology for assessing whether the output of the higher educational institution meets their stakeholders' requirements.

To support the academic staff in the organization and implementation the methodology for assessing whether the output of the higher educational institution meets their stakeholders' requirements.

Educating academic staff members in the method, process, practices, and philosophy help to develop a holistic view of the multiple elements of the system.

To facilitate the involvement of the different stakeholder groups in the continuous development of the HEI system, which is regulated by the methodology.

To disseminate the best practices of the methodology implementation and recommend the systemic approach based on continuous improvement principles within the industry.

### ***For Entrepreneurs***

To participate in HEI's curricula development by provisioning HEIs with required input about the labour market needs and communication of their fundamental importance.

To support entrepreneurial eco-system development by commercializing the innovative ideas introduced by cooperation with HEIs.

To facilitate students' interest in entrepreneurship and product development by initiating HEIs-based workshops for students to build and develop works-like product prototypes and conduct its soft launch.

### ***For Students***

To look for any opportunity to apply the knowledge and skills acquired in HEI to transform the learned competence into the gained experience and enhance their competence and employability.

To participate in hackathons, in business incubators' activities, and screen external environment for business opportunities.

To seek for mentors and advisors proactively to set up a start-up or a business initiative during the years of studies in HEI.

The conclusions and recommendations are relevant to maintaining a HEI's continuous development and supporting the country's entrepreneurial ecosystem. The validation's results of the methodology for assessing the output of business education in accordance with their stakeholder's requirements provide evidence that the approach is feasible for usage as an applicable framework both for theoretical and practical application in the Baltic region and the neighbourhood countries. The methodology provides HEI with a well-described structure for the organization's transformation that also includes a certain degree of flexibility and customization for the needs of the HEI.

Summarizing the results of the Doctoral Thesis, the author concluded that the research goal was achieved, the research hypothesis was proved, and the theses supported.

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## APPENDIXES

Table 1

List of elements of managers' competencies in modern organizations (created by author)

#	Components	Description	Frequency
1.	Communication	ability to express ideas orally and in written form, as well as acts as a facilitator in exchange of ideas and thoughts; acts as an active listener and proactively provides with feedback or response to other parties	18%
2.	Culture awareness	ability to recognize the difference between various cultures incl. interdisciplinary teams, cross-national teams, virtual teams, and different social groups	15%
3.	Teamwork	ability to interact with other people to work together with them to reach a common or different goals	11%
4.	Technical competence	ability to apply knowledge that is specific for the industry	8%
5.	Leadership	ability to lead, motivate, and develop other people	6%
6.	Ethics	ability to act in accordance with supranational and ethnic cultural norms with a high level of moral reasoning, integrity and transparency over time	6%
7.	Business acumen	ability to consider customer needs and business stakeholders' perspectives, as well as current market trends and economic efficiency of decisions	4%
8.	Negotiation	ability to convince others	4%
9.	Strategic thinking	ability to develop strategies to reach long-term goals and adjust them in accordance with the changing environment in order to maintain sustainability of the system	4%
10.	Emotional intelligence	ability to assess and control own emotions	4%
11.	Advisory skills	ability to provide other parties with advice to increase overall quality of administrative actions	3%
12.	Achievement orientation	ability to meet the desired outcome(s)	3%
13.	Conflict management	ability to assess the diversity of stakeholders, and negotiate the best possible solution in an arguable situation	3%
14.	Adaptability	ability for flexible response to the changing environment challenges	3%
15.	Analytical thinking	ability to assess a problem and critically analyse it from different angles, and develop a solution based on facts, not emotions	1%
16.	Coordinating	ability to plan activities among other people efficiently, setting roles and deadlines	1%

Table 2

Overview of resources used for literature review, created by author

Author	Essence of study
Hong&Stahle (2003)	Competence-based Perspective on Knowledge Management
European Commission (2004)	Report on innovation management and knowledge-based economy
Johnson <i>et al.</i> (2006)	Cross-cultural competence in international business
Mathews (2007)	Competences for IT C-level executives

Author	Essence of study
Ingasson & Jonasson (2009)	International Project Management Association (IPMA) “Eye of Competence.” For project managers
International Labour Office (2010)	G20 training strategy for workforce
Maurer & Weiss (2010)	Aspects of managerial work are associated with a need for competence at continuous learning, aging workforce
Chen & Wu (2011)	IT management personnel and its impact on the performance as the C-level executives
Denford & Chan (2011)	Manager’s focus on knowledge capital in knowledge-based economy
Gratton (2011)	Role of technology for managers
Wiek <i>et al.</i> (2011)	Key competencies in sustainability.
Cikmacs (2012)	Competences for C-level executives in IT in Latvia
Guðmundsson (2012)	Management in virtual teams
Wang <i>et al.</i> (2012)	Leadership across cultures
Chipulu <i>et al.</i> (2013)	A Multidimensional Analysis of Project Manager Competences
Kuokkanen <i>et al.</i> (2013)	Transformation of Finnish employees in post War period
Caune <i>et al.</i> (2014)	Research on manager’s capabilities in changing environment of SMEs in Latvia
Nikic <i>et al.</i> (2014)	Socio-emotional competences of managers
Sofany <i>et al.</i> (2014)	Manager’s competences in virtual teams
Urosevic & Grahovic (2014)	Manager’s competences required due to globalization and technological progress
Barbato (2015)	Technological change and industry 4.0 impact on managers
Boca <i>et al.</i> (2015)	A study about ‘managers sophisticated in global management skills and working with people from other countries’.
Carillo (2015)	Changes due to transition from industrial to knowledge societies
Cichobłaziński <i>et al.</i> (2015)	Leadership skills in the turbulent environment
Delaney <i>et al.</i> (2015)	Case of a frontline manager skills development programme
Lapiņa <i>et al.</i> (2015)	Managers Competence Model in Dynamic Environment
Verboncu & Condurache (2015)	Competencies for efficiency
Zyl (2015)	ICT Project Manager Competence Model for financial service industry
Derwik <i>et al.</i> (2016)	Manager competences in logistics and supply chain
Osagie <i>et al.</i> (2017)	Corporate social responsibility impact on manager’s skills
Rosha & Lace (2016)	Coaching in the context of organizational change in Baltic states
Silvius (2016)	Sustainability competence for project managers
Akhtar <i>et al.</i> (2017)	Quantitative-focused techniques, big data analytics and data-driven applications linked with the internet of things, relevant experience and analytical business applications as competences for top managers
Nikitina & Lapiņa (2017)	Manager in cross-cultural teams
Oosthuizen (2017)	Fourth Industrial Revolution Intelligence Framework for leaders
Pauluzzo & Cagnina (2017)	intercultural competences in multinational contexts
Sadovska & Kamola (2017)	Change management in banking and finance in 4IR
Sarka & Ipsen (2017)	Information sharing via social media in software development companies
Sedighi <i>et al.</i> (2017)	Electronic networks of practice (ENoP) in organizations
Zieba <i>et al.</i> (2017)	Insight into KIBS companies

Table 3

Relationship among competencies for managers

Node	A	Node	B	Jaccard’s coefficient
Nodes\Idea_Lapina_Model\...		Nodes\Idea_Lapina_Model\...		
PERSONAL\Collaboration		INNOVATIVE\Ability to create (creativity)		0.6522

SOCIAL\Ability to form relationship outside the company	SOCIAL\Ability to form relationship in company	0.6429
PERSONAL\Collaboration	SOCIAL\Ability to form relationship outside the company	0.6400
PERSONAL\Erudition	PERSONAL\Collaboration	0.6364
SOCIAL\Ability to form relationship outside the company	INNOVATIVE\Ability to create (creativity)	0.6250
INNOVATIVE\Ability to spot and cease opportunities	INNOVATIVE\Ability to generate ideas	0.6190
PROFESSIONAL\Ability to react, delegate, and divide risks	PROFESSIONAL\Ability to Analyse and Evaluate	0.6154
PERSONAL\Leadership	SOCIAL\Ability to form relationship in company	0.6129
PERSONAL\Erudition	SOCIAL\Ability to form	0.6087
PERSONAL\Collaboration	SOCIAL\Ability to form	0.6071
INNOVATIVE\Willingness to learn	PERSONAL\Collaboration	0.6071

Table 4

EntreComp competences framework (adapted EntreComp visual model by author)

<b>EntreComp Groups of Competences</b>	<b>Competence</b>
Ideas and Opportunities	C1: Spotting Opportunities
Ideas and Opportunities	C2: Creativity
Ideas and Opportunities	C3: Vision
Ideas and Opportunities	C4: Valuing Ideas
Ideas and Opportunities	C5: Ethical and Sustainable Thinking
Ideas and Opportunities	C6: Self-awareness and self-efficacy
Resources	C7: Motivation and Perseverance
Resources	C8: Mobilizing Resources
Resources	C9: Financial and Economic Literacy
Resources	C10: Mobilizing Others
Resources	C11: Taking the Initiative
Into Action	C12: Planning and Management
Into Action	C13: Coping with Ambiguity and Risk
Into Action	C14: Working with Others
Into Action	C15: Learning Through Experience

Table 5

## SEAS project ultimate questions list for IEO research

Qs ID	Layers Affecting IEO	Question's Transcription	Source	Question Description in Previous studies
Q5	Social Context. Family	Does your family run a business	Baughn <i>et al.</i> (2006)	My family would think that it is a very good idea that I start my own business
Q8.2	Social Context. Family	One of my parents runs a business	Baughn <i>et al.</i> (2006)	My family would think that it is a very good idea that I start my own business
Q8.5	Social Context. Family	Someone from my extended family runs a business	Baughn <i>et al.</i> (2006)	My family would think that it is a very good idea that I start my own business
Q8.6	Social Context. Friends	One of my friends runs a business	Dabic <i>et al.</i> (2010)	Partner with someone to start business
Q9	Social Context. Family. Friends	Have you helped in running this company	Dabic <i>et al.</i> (2010)	Work for immediate family business
Q18.9	Social Context. State	Assess whether you would be afraid of each of the following aspects of starting your own business - Lack of state support	Kollmann (2007)	Empirical research provides some evidence that the interest in starting a business (as part of the EO) is determined by ... supportive government regulations
Q18.10	Social Context. Family. Friends.	Assess whether you would be afraid of each of the following aspects of starting your own business - Lack of support from family and friends	Baughn <i>et al.</i> , 2006	Family and friends may therefore serve as critical sources of both normative and resource support.
Q45	Social Context. Family	If you decide to be an entrepreneur, your family members support you:	Baughn <i>et al.</i> (2006)	My family would think that it is a very good idea that I start my own business
Q46	Social Context. Friends	If you decide to be an entrepreneur, your friends / acquaintances support you	Baughn <i>et al.</i> (2006)	My friends would want me to start my own business.
Q47	Social Context. Economics	Potential entrepreneurs are encouraged to set up businesses through a business support system that includes private, public and non-governmental organizations:	Baughn <i>et al.</i> (2006)	To turn a new idea into businesses is an admired career path in my country.
Q48	Social Context. Economics	It is easy to raise funds for your own business in your country	Baughn <i>et al.</i> (2006)	To turn a new idea into businesses is an admired career path in my country.
Q49	Social Context. Economics	The economy of your country provides many opportunities and possibilities for entrepreneurs	Baughn <i>et al.</i> (2006)	To turn a new idea into businesses is an admired career path in my country.
Q42	HEI	Studying at the university encourages you to develop creative ideas to become an entrepreneur:		
Q43	HEI	Your university provides the necessary knowledge in the field of entrepreneurship:		

Qs ID	Layers Affecting IEO	Question's Transcription	Source	Question Description in Previous studies
Q44	HEI	Studying at your university develops your abilities and entrepreneurial skills:		

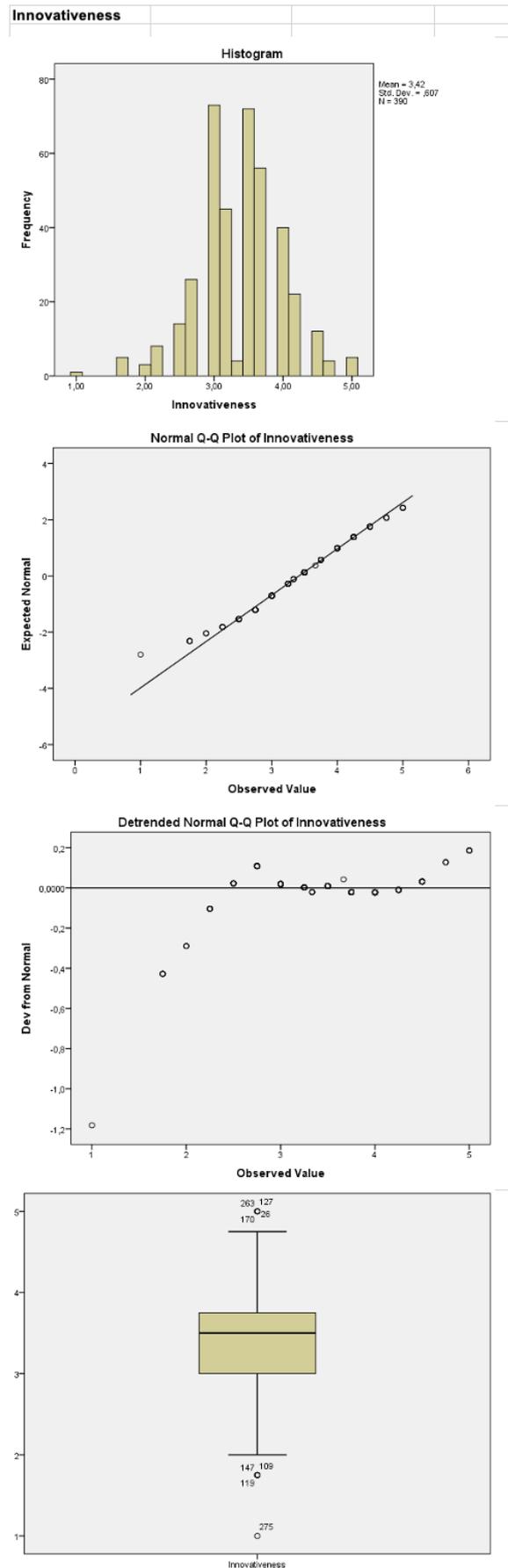


Fig. 1 Innovativeness and Creativity

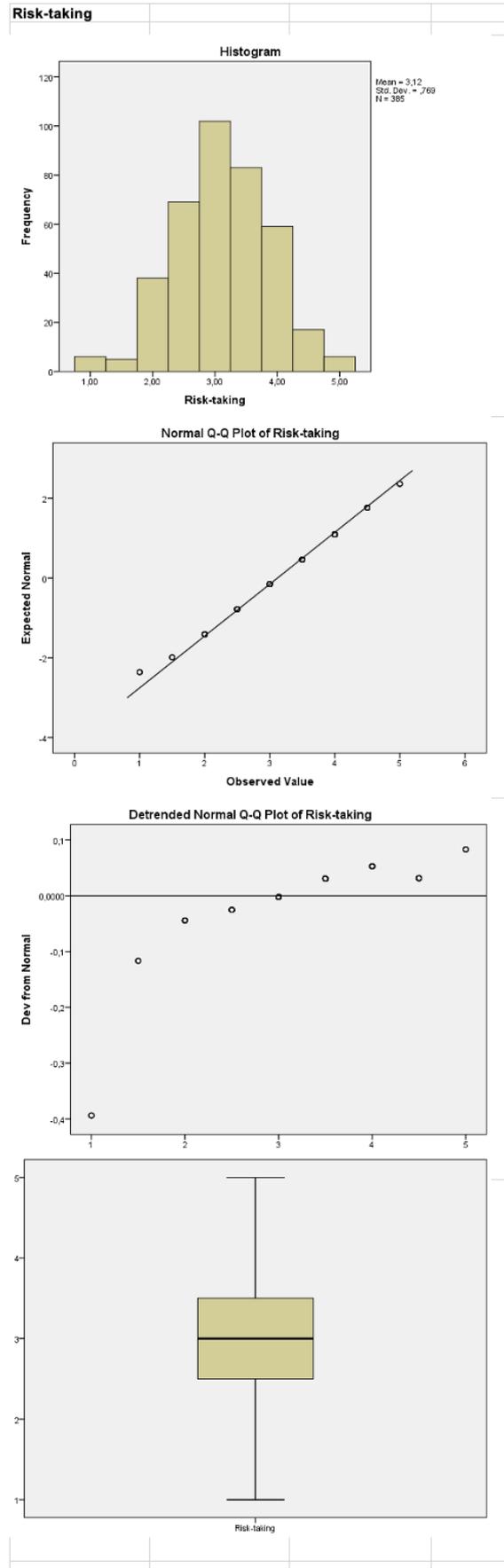
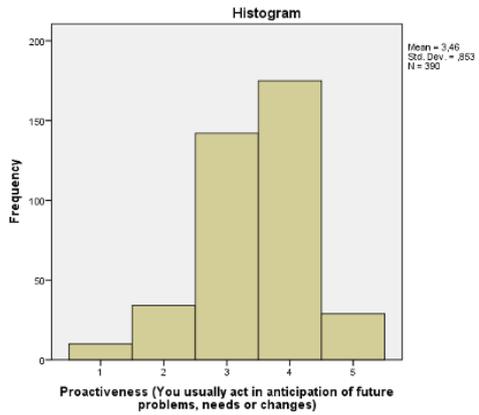
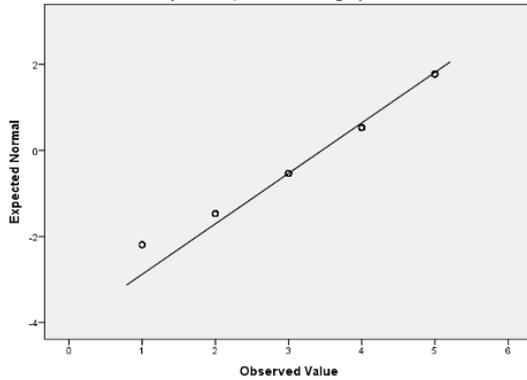


Fig. 2 Risk-taking

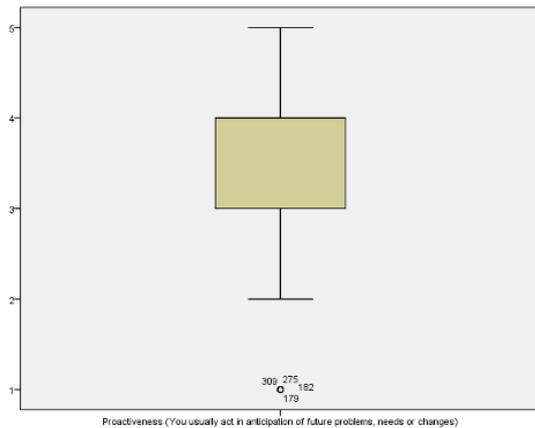
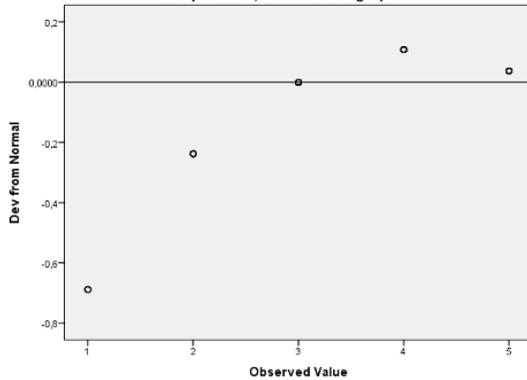
**Proactiveness (You usually act in anticipation of future problems, need**



**Normal Q-Q Plot of Proactiveness (You usually act in anticipation of future problems, needs or changes)**



**Detrended Normal Q-Q Plot of Proactiveness (You usually act in anticipation of future problems, needs or changes)**



**Fig. 3 Proactiveness**

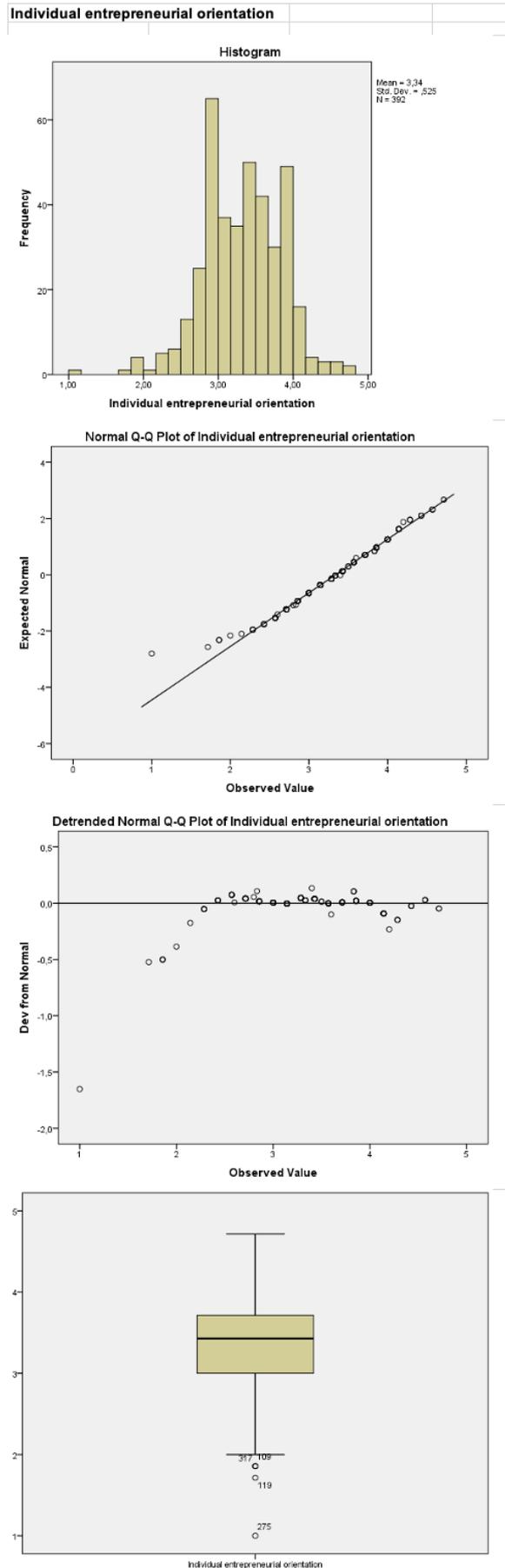


Fig. 4 Individual entrepreneurial orientation

Table 6

## Descriptive Statistics for total sample, SEAS research

Descriptives			Statistic	Std. Error
Innovativeness	Mean		3,6397	,01345
	95% Confidence Interval for Mean	Lower Bound	3,6133	
		Upper Bound	3,6660	
	5% Trimmed Mean		3,6631	
	Median		3,7500	
	Variance		,643	
	Std. Deviation		,80200	
	Minimum		1,00	
	Maximum		5,00	
	Range		4,00	
	Interquartile Range		1,25	
	Skewness		-,278	,041
	Kurtosis		,006	,082
	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Mean		3,94
95% Confidence Interval for Mean		Lower Bound	3,92	
		Upper Bound	3,97	
5% Trimmed Mean			4,01	
Median			4,00	
Variance			,785	
Std. Deviation			,886	
Minimum			1	
Maximum			5	
Range			4	
Interquartile Range			2	
Skewness			-,785	,041
Kurtosis			,635	,082
Risk-taking		Mean		3,4744
	95% Confidence Interval for Mean	Lower Bound	3,4434	
		Upper Bound	3,5054	
	5% Trimmed Mean		3,4975	
	Median		3,5000	
	Variance		,889	
	Std. Deviation		,94264	
	Minimum		1,00	
	Maximum		5,00	
	Range		4,00	
	Interquartile Range		1,00	
	Skewness		-,231	,041
	Kurtosis		-,449	,082
	Individual entrepreneurial orientation	Mean		3,6361
95% Confidence Interval for Mean		Lower Bound	3,6122	
		Upper Bound	3,6600	
5% Trimmed Mean			3,6485	
Median			3,5714	
Variance			,529	
Std. Deviation			,72737	
Minimum			1,00	
Maximum			5,00	
Range			4,00	
Interquartile Range			1,00	
Skewness			-,201	,041
Kurtosis			,299	,082

Table 7

## Descriptive Statistics for the sample from Poland, SEAS research

Descriptives				Statistic	Std. Error
Country					
POL	Innovativeness	Mean		3,2868	,02125
		95% Confidence Interval for Mean	Lower Bound	3,2451	
			Upper Bound	3,3285	
		5% Trimmed Mean		3,2908	
		Median		3,2500	
		Variance		,461	
		Std. Deviation		,67867	
		Minimum		1,00	
		Maximum		5,00	
		Range		4,00	
		Interquartile Range		,94	
		Skewness		-,146	,077
		Kurtosis		,060	,153
		Proactiveness (You usually act in anticipation of future problems, needs or changes)	Mean		3,98
	95% Confidence Interval for Mean		Lower Bound	3,93	
			Upper Bound	4,03	
	5% Trimmed Mean			4,04	
	Median			4,00	
	Variance			,650	
	Std. Deviation			,806	
	Minimum			1	
	Maximum			5	
	Range			4	
	Interquartile Range			0	
	Skewness			-,795	,077
	Kurtosis			,919	,153
	Risk-taking		Mean		3,1240
		95% Confidence Interval for Mean	Lower Bound	3,0730	
			Upper Bound	3,1750	
		5% Trimmed Mean		3,1269	
		Median		3,0000	
		Variance		,689	
		Std. Deviation		,83004	
		Minimum		1,00	
		Maximum		5,00	
		Range		4,00	
		Interquartile Range		1,00	
		Skewness		-,098	,077
		Kurtosis		-,299	,153
		Individual entrepreneurial orientation	Mean		3,3386
95% Confidence Interval for Mean	Lower Bound		3,3041		
	Upper Bound		3,3731		
5% Trimmed Mean			3,3415		
Median			3,2857		
Variance			,316		
Std. Deviation			,56187		
Minimum			1,00		
Maximum			5,00		
Range			4,00		
Interquartile Range			,71		
Skewness			-,134	,077	
Kurtosis			,547	,153	

Table 8

## Descriptive Statistics for the sample from Ukraine, SEAS research

Descriptives					
Country			Statistic	Std. Error	
UA	Innovativeness	Mean	3,5332	,02345	
		95% Confidence Interval for Mean	Lower Bound	3,4872	
			Upper Bound	3,5793	
		5% Trimmed Mean	3,5330		
		Median	3,5000		
		Variance	,397		
		Std. Deviation	,63016		
		Minimum	1,00		
		Maximum	5,00		
		Range	4,00		
		Interquartile Range	1,00		
		Skewness	-,086	,091	
		Kurtosis	,329	,182	
	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Mean	3,87	,031	
		95% Confidence Interval for Mean	Lower Bound	3,81	
			Upper Bound	3,93	
		5% Trimmed Mean	3,93		
		Median	4,00		
		Variance	,685		
		Std. Deviation	,827		
		Minimum	1		
		Maximum	5		
		Range	4		
		Interquartile Range	1		
		Skewness	-,778	,091	
		Kurtosis	,921	,182	
	Risk-taking	Mean	3,4155	,02884	
		95% Confidence Interval for Mean	Lower Bound	3,3589	
			Upper Bound	3,4721	
		5% Trimmed Mean	3,4208		
		Median	3,5000		
		Variance	,600		
		Std. Deviation	,77482		
		Minimum	1,00		
		Maximum	5,00		
		Range	4,00		
		Interquartile Range	1,00		
		Skewness	-,277	,091	
		Kurtosis	,013	,182	
	Individual entrepreneurial orientation	Mean	3,5488	,01991	
		95% Confidence Interval for Mean	Lower Bound	3,5097	
			Upper Bound	3,5879	
5% Trimmed Mean		3,5523			
Median		3,5714			
Variance		,286			
Std. Deviation		,53497			
Minimum		1,14			
Maximum		5,00			
Range		3,86			
Interquartile Range		,57			
Skewness		-,158	,091		
Kurtosis		,800	,182		

Table 9

## Descriptive Statistics for the sample from Latvia, SEAS research

Descriptives				Statistic	Std. Error
Country					
LV	Innovativeness	Mean		3,4231	,03201
		95% Confidence Interval for Mean	Lower Bound	3,3602	
			Upper Bound	3,4861	
		5% Trimmed Mean		3,4315	
		Median		3,5000	
		Variance		,370	
		Std. Deviation		,60826	
		Minimum		1,00	
		Maximum		5,00	
		Range		4,00	
		Interquartile Range		,75	
		Skewness		-,227	,128
		Kurtosis		,729	,256
		Proactiveness (You usually act in anticipation of future problems, needs or changes)	Mean		3,48
	95% Confidence Interval for Mean		Lower Bound	3,39	
			Upper Bound	3,57	
	5% Trimmed Mean			3,50	
	Median			4,00	
	Variance			,695	
	Std. Deviation			,833	
	Minimum			1	
	Maximum			5	
	Range			4	
	Interquartile Range			1	
	Skewness			-,542	,128
	Kurtosis			,513	,256
	Risk-taking		Mean		3,1177
		95% Confidence Interval for Mean	Lower Bound	3,0392	
			Upper Bound	3,1963	
		5% Trimmed Mean		3,1153	
		Median		3,0000	
		Variance		,576	
		Std. Deviation		,75874	
		Minimum		1,00	
		Maximum		5,00	
		Range		4,00	
Interquartile Range			1,00		
Skewness			-,044	,128	
Kurtosis			,037	,256	
Individual entrepreneurial orientation		Mean		3,3443	,02764
	95% Confidence Interval for Mean	Lower Bound	3,2899		
		Upper Bound	3,3986		
	5% Trimmed Mean		3,3538		
	Median		3,4286		
	Variance		,276		
	Std. Deviation		,52519		
	Minimum		1,00		
	Maximum		4,71		
	Range		3,71		
	Interquartile Range		,71		
	Skewness		-,347	,128	
	Kurtosis		,940	,256	

Table 10

## Descriptive Statistics for the sample from Bulgaria, SEAS research

Descriptives				
Country			Statistic	Std. Error
BUG	Innovativeness	Mean	3,2638	,05329
		95% Confidence Interval for Mean	Lower Bound	3,1587
			Upper Bound	3,3689
		5% Trimmed Mean	3,2625	
		Median	3,2500	
		Variance	,548	
		Std. Deviation	,74036	
		Minimum	1,75	
		Maximum	5,00	
		Range	3,25	
		Interquartile Range	1,00	
		Skewness	-,142	,175
		Kurtosis	-,486	,348
		Proactiveness (You usually act in anticipation of future problems, needs or changes)	Mean	3,61
	95% Confidence Interval for Mean		Lower Bound	3,49
			Upper Bound	3,73
	5% Trimmed Mean		3,62	
	Median		4,00	
	Variance		,676	
	Std. Deviation		,822	
	Minimum		2	
	Maximum		5	
	Range		3	
	Interquartile Range		1	
	Skewness		-,022	,175
	Kurtosis		-,541	,348
	Risk-taking		Mean	2,7668
		95% Confidence Interval for Mean	Lower Bound	2,6460
			Upper Bound	2,8876
		5% Trimmed Mean	2,7658	
		Median	3,0000	
		Variance	,724	
		Std. Deviation	,85088	
		Minimum	1,00	
		Maximum	5,00	
		Range	4,00	
		Interquartile Range	1,50	
		Skewness	-,026	,175
		Kurtosis	-,581	,348
		Individual entrepreneurial orientation	Mean	3,1722
	95% Confidence Interval for Mean		Lower Bound	3,0880
			Upper Bound	3,2564
5% Trimmed Mean	3,1760			
Median	3,1429			
Variance	,352			
Std. Deviation	,59308			
Minimum	1,86			
Maximum	4,57			
Range	2,71			
Interquartile Range	,86			
Skewness	-,100		,175	
Kurtosis	-,459		,348	

Table 11

## Descriptive Statistics for the sample from Lithuania, SEAS research

Descriptives					
Country			Statistic	Std. Error	
LT	Innovativeness	Mean	4,1053	,02299	
		95% Confidence Interval for Mean	Lower Bound	4,0602	
			Upper Bound	4,1504	
		5% Trimmed Mean	4,1784		
		Median	4,2500		
		Variance	,667		
		Std. Deviation	,81656		
		Minimum	1,00		
		Maximum	5,00		
		Range	4,00		
		Interquartile Range	1,00		
		Skewness	-1,266	,069	
		Kurtosis	2,191	,138	
		Proactiveness (You usually act in anticipation of future problems, needs or changes)	Mean	4,14	,026
	95% Confidence Interval for Mean		Lower Bound	4,09	
			Upper Bound	4,19	
	5% Trimmed Mean		4,24		
	Median		4,00		
	Variance		,875		
	Std. Deviation		,936		
	Minimum		1		
	Maximum		5		
	Range		4		
	Interquartile Range		1		
	Skewness		-1,153	,069	
	Kurtosis		1,289	,138	
	Risk-taking		Mean	4,0016	,02579
		95% Confidence Interval for Mean	Lower Bound	3,9510	
			Upper Bound	4,0522	
		5% Trimmed Mean	4,0775		
		Median	4,0000		
		Variance	,839		
		Std. Deviation	,91619		
		Minimum	1,00		
		Maximum	5,00		
		Range	4,00		
		Interquartile Range	1,50		
		Skewness	-,958	,069	
		Kurtosis	,702	,138	
		Individual entrepreneurial orientation	Mean	4,0808	,02199
	95% Confidence Interval for Mean		Lower Bound	4,0377	
			Upper Bound	4,1239	
5% Trimmed Mean	4,1467				
Median	4,2857				
Variance	,610				
Std. Deviation	,78111				
Minimum	1,00				
Maximum	5,00				
Range	4,00				
Interquartile Range	1,14				
Skewness	-1,286		,069		
Kurtosis	2,434		,138		

Table 12

## Mann Whitney Test for Demographic

	Innovativeness and Creativity	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Risk-taking	Individual entrepreneurial orientation
Mann-Whitney U	1465426,500	1508064,000	1387711,500	1434180,000
Wilcoxon W	2704951,500	2731894,000	2619376,500	2678433,000
Z	-3,586	-1,698	-5,867	-4,761
Asymp. Sig. (2-tailed)	,000	,090	,000	,000

- a. Grouping Variable: Sex  
b. Test Statistics<sup>a</sup>

Table 13

## Table: Spearman's test for H1 – H4

Correlations						
			Innovativeness	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Risk-taking	Individual entrepreneurial orientation
Spearman's rho	Innovativeness	Correlation Coefficient	1,000	,412**	,617**	,931**
		Sig. (2-tailed)		,000	0,000	0,000
		N	3595	3571	3577	3595
	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Correlation Coefficient	,412**	1,000	,355**	,550**
		Sig. (2-tailed)	,000		,000	,000
		N	3571	3574	3561	3574
	Risk-taking	Correlation Coefficient	,617**	,355**	1,000	,822**
		Sig. (2-tailed)	0,000	,000		0,000
		N	3577	3561	3583	3583
	Individual entrepreneurial orientation	Correlation Coefficient	,931**	,550**	,822**	1,000
		Sig. (2-tailed)	0,000	,000	0,000	
		N	3595	3574	3583	3601

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Table 14

## Spearman's correlation for H4 – H8

Correlations			Innovativeness and Creativity	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Risk-taking	Individual entrepreneurial orientation	Studying at the university encourages you to develop creative ideas to become an entrepreneur	Your university provides the necessary knowledge in the field of entrepreneurship	Studying at your university develops your abilities and entrepreneurial skills
Spearman's rho	Innovativeness and Creativity	Correlation Coefficient	1,000	,412**	,617**	,931**	,473**	,435**	,432**
		Sig. (2-tailed)		,000	0,000	0,000	,000	,000	,000
		N	3595	3571	3577	3595	3551	3556	3547
Proactiveness (You usually act in anticipation of future problems, needs or changes)	Correlation Coefficient	Correlation Coefficient	,412**	1,000	,355**	,550**	,256**	,214**	,237**
		Sig. (2-tailed)	,000	,000	,000	,000	,000	,000	,000
		N	3571	3574	3561	3574	3535	3541	3534
Risk-taking	Correlation Coefficient	Correlation Coefficient	,617**	,355**	1,000	,822**	,422**	,379**	,397**
		Sig. (2-tailed)	0,000	,000	,000	0,000	,000	,000	,000
		N	3577	3561	3583	3583	3554	3559	3551
Individual entrepreneurial orientation	Correlation Coefficient	Correlation Coefficient	,931**	,550**	,822**	1,000	,491**	,442**	,450**
		Sig. (2-tailed)	0,000	,000	0,000	,000	,000	,000	,000
		N	3595	3574	3583	3601	3556	3561	3553

Studying at the university encourages you to develop creative ideas to become an entrepreneur	Correlation Coefficient	,473**	,256**	,422**	,491**	1,000	,680**	,700**
	Sig. (2-tailed)	,000	,000	,000	,000		0,000	0,000
	N	3551	3535	3554	3556	3559	3547	3539
Your university provides the necessary knowledge in the field of entrepreneurship	Correlation Coefficient	,435**	,214**	,379**	,442**	,680**	1,000	,820**
	Sig. (2-tailed)	,000	,000	,000	,000	0,000		0,000
	N	3556	3541	3559	3561	3547	3564	3544
Studying at your university develops your abilities and entrepreneurial skills	Correlation Coefficient	,432**	,237**	,397**	,450**	,700**	,820**	1,000
	Sig. (2-tailed)	,000	,000	,000	,000	0,000	0,000	
	N	3547	3534	3551	3553	3539	3544	3556

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Table 15

Spearman's correlation tests for samples from Poland, Ukraine, Lithuania, Latvia, and Bulgaria, H4 – H7

Correlations			Innovativeness and Creativity	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Risk-taking	Individual entrepreneurial orientation	Studying at the university encourages you to develop creative ideas to become an entrepreneur	Your university provides the necessary know/ledge in the field of entrepreneurship	Studying at your university develops your abilities and entrepreneurial skills
Country	Spearman's rho	Innovativeness and Creativity	Correlation Coefficient						
POL			1,000	,190**	,365**	,887**	,170**	,039	,014
				,000	,000	0,000	,000	,214	,654

		N	1024	1022	1022	1024	1018	1019	1017	
		Proactiveness (You usually act in anticipation of future problems, needs or changes)	Correlation Coefficient	,190**	1,000	,097**	,359**	,025	-,048	-,044
			Sig. (2-tailed)	,000		,002	,000	,422	,125	,158
		N	1022	1022	1020	1022	1016	1017	1015	
		Risk-taking	Correlation Coefficient	,365**	,097**	1,000	,691**	,127**	,038	,085**
			Sig. (2-tailed)	,000	,002		,000	,000	,228	,006
		N	1022	1020	1022	1022	1018	1019	1017	
		Individual entrepreneurial orientation	Correlation Coefficient	,887**	,359**	,691**	1,000	,178**	,038	,040
			Sig. (2-tailed)	0,000	,000	,000		,000	,221	,201
		N	1024	1022	1022	1024	1018	1019	1017	
		Studying at the university encourages you to develop creative ideas to become an entrepreneur	Correlation Coefficient	,170**	,025	,127**	,178**	1,000	,532**	,561**
			Sig. (2-tailed)	,000	,422	,000	,000		,000	,000
		N	1018	1016	1018	1018	1018	1015	1013	
		Your university provides the necessary knowledge in the field of entrepreneurship	Correlation Coefficient	,039	-,048	,038	,038	,532**	1,000	,756**
			Sig. (2-tailed)	,214	,125	,228	,221	,000		,000
		N	1019	1017	1019	1019	1015	1019	1014	
		Studying at your university develops your abilities and entrepreneurial skills	Correlation Coefficient	,014	-,044	,085**	,040	,561**	,756**	1,000
			Sig. (2-tailed)	,654	,158	,006	,201	,000	,000	
UA	Spearman's rho	N	1017	1015	1017	1017	1013	1014	1017	
		Innovativeness and Creativity	Correlation Coefficient	1,000	,171**	,420**	,890**	,139**	,049	,124**
			Sig. (2-tailed)		,000	,000	,000	,000	,192	,001
		N	730	724	725	730	716	718	715	

LV	Spearman's rho	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Correlation Coefficient	,171**	1,000	,106**	,361**	,051	,005	,018
			Sig. (2-tailed)	,000		,004	,000	,175	,900	,629
			N	724	727	725	727	716	718	715
		Risk-taking	Correlation Coefficient	,420**	,106**	1,000	,719**	,126**	-,017	,054
			Sig. (2-tailed)	,000	,004		,000	,001	,655	,146
			N	725	725	729	729	720	722	719
		Individual entrepreneurial orientation	Correlation Coefficient	,890**	,361**	,719**	1,000	,170**	,035	,116**
			Sig. (2-tailed)	,000	,000	,000		,000	,347	,002
			N	730	727	729	734	720	722	719
		Studying at the university encourages you to develop creative ideas to become an entrepreneur	Correlation Coefficient	,139**	,051	,126**	,170**	1,000	,466**	,564**
			Sig. (2-tailed)	,000	,175	,001	,000		,000	,000
			N	716	716	720	720	720	716	713
		Your university provides the necessary knowledge in the field of entrepreneurship	Correlation Coefficient	,049	,005	-,017	,035	,466**	1,000	,697**
			Sig. (2-tailed)	,192	,900	,655	,347	,000		,000
			N	718	718	722	722	716	722	715
		Studying at your university develops your abilities and entrepreneurial skills	Correlation Coefficient	,124**	,018	,054	,116**	,564**	,697**	1,000
			Sig. (2-tailed)	,001	,629	,146	,002	,000	,000	
			N	715	715	719	719	713	715	719
Innovativeness and Creativity	Correlation Coefficient	1,000	,333**	,348**	,878**	,296**	,234**	,174**		
	Sig. (2-tailed)		,000	,000	,000	,000	,000	,001		
	N	367	367	361	367	360	359	359		
Proactiveness (You usually act in	Correlation Coefficient	,333**	1,000	,210**	,521**	,149**	,089	,146**		

		anticipation of future problems, needs or changes)	Sig. (2-tailed)	,000		,000	,000	,005	,091	,005
			N	367	367	361	367	360	359	359
		Risk-taking	Correlation Coefficient	,348**	,210**	1,000	,684**	,134*	,103	,088
			Sig. (2-tailed)	,000	,000		,000	,011	,050	,096
			N	361	361	363	363	361	360	361
		Individual entrepreneurial orientation	Correlation Coefficient	,878**	,521**	,684**	1,000	,274**	,206**	,174**
			Sig. (2-tailed)	,000	,000	,000		,000	,000	,001
			N	367	367	363	369	361	360	361
		Studying at the university encourages you to develop creative ideas to become an entrepreneur	Correlation Coefficient	,296**	,149**	,134*	,274**	1,000	,495**	,515**
			Sig. (2-tailed)	,000	,005	,011	,000		,000	,000
		Your university provides the necessary knowledge in the field of entrepreneurship	N	360	360	361	361	361	359	359
			Correlation Coefficient	,234**	,089	,103	,206**	,495**	1,000	,653**
			Sig. (2-tailed)	,000	,091	,050	,000	,000		,000
			N	359	359	360	360	359	360	358
		Studying at your university develops your abilities and entrepreneurial skills	Correlation Coefficient	,174**	,146**	,088	,174**	,515**	,653**	1,000
			Sig. (2-tailed)	,001	,005	,096	,001	,000	,000	
			N	359	359	361	361	359	358	361
BUG	Spearman's rho	Innovativeness and Creativity	Correlation Coefficient	1,000	,229**	,384**	,915**	,153*	,141	,132
			Sig. (2-tailed)		,001	,000	,000	,036	,052	,069
			N	195	195	193	195	188	191	190
		Proactiveness (You usually act in	Correlation Coefficient	,229**	1,000	-,024	,341**	-,177*	-,139	-,148*

		anticipation of future problems, needs or changes)	Sig. (2-tailed)	,001		,744	,000	,015	,055	,042
			N	195	195	193	195	188	191	190
		Risk-taking	Correlation Coefficient	,384**	-,024	1,000	,668**	,363**	,278**	,331**
			Sig. (2-tailed)	,000	,744		,000	,000	,000	,000
			N	193	193	193	193	187	190	189
		Individual entrepreneurial orientation	Correlation Coefficient	,915**	,341**	,668**	1,000	,224**	,201**	,216**
			Sig. (2-tailed)	,000	,000	,000		,002	,005	,003
			N	195	195	193	195	188	191	190
		Studying at the university encourages you to develop creative ideas to become an entrepreneur	Correlation Coefficient	,153*	-,177*	,363**	,224**	1,000	,825**	,808**
			Sig. (2-tailed)	,036	,015	,000	,002		,000	,000
		Your university provides the necessary knowledge in the field of entrepreneurship	N	188	188	187	188	191	191	190
			Correlation Coefficient	,141	-,139	,278**	,201**	,825**	1,000	,866**
			Sig. (2-tailed)	,052	,055	,000	,005	,000		,000
			N	191	191	190	191	191	194	193
		Studying at your university develops your abilities and entrepreneurial skills	Correlation Coefficient	,132	-,148*	,331**	,216**	,808**	,866**	1,000
			Sig. (2-tailed)	,069	,042	,000	,003	,000	,000	
			N	190	190	189	190	190	193	193
LT	Spearman's rho	Innovativeness and Creativity	Correlation Coefficient	1,000	,608**	,702**	,941**	,609**	,579**	,566**
			Sig. (2-tailed)		,000	,000	0,000	,000	,000	,000
			N	1279	1263	1276	1279	1269	1269	1266
		Proactiveness (You usually act in	Correlation Coefficient	,608**	1,000	,560**	,730**	,478**	,458**	,493**

anticipation of future problems, needs or changes)	Sig. (2-tailed)	,000		,000	,000	,000	,000	,000
	N	1263	1263	1262	1263	1255	1256	1255
Risk-taking	Correlation Coefficient	,702**	,560**	1,000	,868**	,519**	,480**	,467**
	Sig. (2-tailed)	,000	,000		0,000	,000	,000	,000
	N	1276	1262	1276	1276	1268	1268	1265
Individual entrepreneurial orientation	Correlation Coefficient	,941**	,730**	,868**	1,000	,624**	,586**	,580**
	Sig. (2-tailed)	0,000	,000	0,000		,000	,000	,000
	N	1279	1263	1276	1279	1269	1269	1266
Studying at the university encourages you to develop creative ideas to become an entrepreneur	Correlation Coefficient	,609**	,478**	,519**	,624**	1,000	,717**	,692**
	Sig. (2-tailed)	,000	,000	,000	,000		,000	,000
	N	1269	1255	1268	1269	1269	1266	1264
Your university provides the necessary knowledge in the field of entrepreneurship	Correlation Coefficient	,579**	,458**	,480**	,586**	,717**	1,000	,821**
	Sig. (2-tailed)	,000	,000	,000	,000	,000		0,000
	N	1269	1256	1268	1269	1266	1269	1264
Studying at your university develops your abilities and entrepreneurial skills	Correlation Coefficient	,566**	,493**	,467**	,580**	,692**	,821**	1,000
	Sig. (2-tailed)	,000	,000	,000	,000	,000	0,000	
	N	1266	1255	1265	1266	1264	1264	1266

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Table 16

## Mann Whitney test for total sample, H8 – H11

Test Statistics <sup>a</sup>				
	Innovativeness	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Risk-taking	Individual entrepreneurial orientation
Mann-Whitney U	785803,000	751984,500	784255,000	795363,000
Wilcoxon W	5463014,000	896437,500	5427883,000	5487879,000
Z	-1,597	-3,084	-1,483	-1,288
Asymp. Sig. (2-tailed)	,110	,002	,138	,198

a. Grouping Variable: Field of study

Table 17

## Mann-Whitney Test for all sample, ranks, H8 – H11

Ranks				
Field of study		N	Mean Rank	Sum of Ranks
Innovativeness	Management & Entrepreneurship & Marketing & Economics	537	1863,68	1000796,00
	STEM	3058	1786,47	5463014,00
	Total	3595		
Proactiveness (You usually act in anticipation of future problems, needs or changes)	Management & Entrepreneurship & Marketing & Economics	537	1669,34	896437,50
	STEM	3037	1808,39	5492087,50
	Total	3574		
Risk-taking	Management & Entrepreneurship & Marketing & Economics	536	1852,34	992853,00
	STEM	3047	1781,39	5427883,00
	Total	3583		
Individual entrepreneurial orientation	Management & Entrepreneurship & Marketing & Economics	538	1854,13	997522,00
	STEM	3063	1791,67	5487879,00
	Total	3601		

Table 18

Mann-Whitney Test for the samples from Poland, Ukraine, Lithuania, Latvia, Bulgaria, ranks,  
H8 – H11

Ranks			N	Mean Rank	Sum of Ranks
Country					
POL	Innovativeness and Creativity	Management & Entrepreneurship & Marketing & Economics	80	581,19	46495,50
		STEM	944	506,68	478304,50
		Total	1024		
	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Management & Entrepreneurship & Marketing & Economics	80	420,48	33638,00
		STEM	942	519,23	489115,00
		Total	1022		
	Risk-taking	Management & Entrepreneurship & Marketing & Economics	80	538,21	43056,50
		STEM	942	509,23	479696,50
		Total	1022		
	Individual entrepreneurial orientation	Management & Entrepreneurship & Marketing & Economics	80	552,36	44189,00
		STEM	944	509,12	480611,00
		Total	1024		
UA	Innovativeness and Creativity	Management & Entrepreneurship & Marketing & Economics	185	388,89	71945,00
		STEM	545	357,56	194870,00
		Total	730		
	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Management & Entrepreneurship & Marketing & Economics	185	381,29	70539,00
		STEM	542	358,10	194089,00
		Total	727		
	Risk-taking	Management & Entrepreneurship & Marketing & Economics	185	397,47	73532,00
		STEM	544	353,96	192553,00
		Total	729		
	Individual entrepreneurial orientation	Management & Entrepreneurship & Marketing & Economics	186	402,59	74881,00
		STEM	548	355,59	194864,00
		Total	734		
LV	Innovativeness and Creativity	Management & Entrepreneurship & Marketing & Economics	94	191,81	18030,50
		STEM	273	181,31	49497,50
		Total	367		
	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Management & Entrepreneurship & Marketing & Economics	94	182,47	17152,50
		STEM	273	184,53	50375,50
		Total	367		
	Risk-taking	Management & Entrepreneurship & Marketing & Economics	93	190,18	17686,50
		STEM	270	179,18	48379,50
		Total	363		
	Individual entrepreneurial orientation	Management & Entrepreneurship & Marketing & Economics	94	191,13	17966,00
		STEM	275	182,91	50299,00
		Total	369		
BUG	Innovativeness and Creativity	Management & Entrepreneurship & Marketing & Economics	67	111,36	7461,00
		STEM	128	91,01	11649,00

LT	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Total	195		
		Management & Entrepreneurship & Marketing & Economics	67	85,66	5739,00
	Risk-taking	STEM	128	104,46	13371,00
		Total	195		
	Individual entrepreneurial orientation	Management & Entrepreneurship & Marketing & Economics	67	117,52	7874,00
		STEM	128	87,78	11236,00
	Innovativeness and Creativity	Total	195		
		Management & Entrepreneurship & Marketing & Economics	111	768,22	85272,50
	Proactiveness (You usually act in anticipation of future problems, needs or changes)	STEM	1168	627,81	733287,50
		Total	1279		
	Risk-taking	Management & Entrepreneurship & Marketing & Economics	111	714,74	79336,00
		STEM	1152	624,03	718880,00
	Individual entrepreneurial orientation	Total	1263		
		Management & Entrepreneurship & Marketing & Economics	111	753,70	83660,50
		STEM	1165	627,52	731065,50
		Total	1276		
		Management & Entrepreneurship & Marketing & Economics	111	773,39	85846,50
		STEM	1168	627,32	732713,50
		Total	1279		

a. Grouping Variable: Field of study

Table 19

Spearman's test for H12-H15, all sample, correlations

			Innovativeness and Creativity	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Risk-taking	Individual entrepreneurial orientation	Social context
Spearman's rho	Innovativeness and Creativity	Correlation Coefficient	1,000	,412**	,617**	,931**	,511**
		Sig. (2-tailed)		,000	0,000	0,000	,000
		N	3595	3571	3577	3595	3593
	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Correlation Coefficient	,412**	1,000	,355**	,550**	,322**
		Sig. (2-tailed)	,000	,000	,000	,000	,000
		N	3571	3574	3561	3574	3572
	Risk-taking	Correlation Coefficient	,617**	,355**	1,000	,822**	,474**
		Sig. (2-tailed)	0,000	,000	,000	0,000	,000
		N	3577	3561	3583	3583	3582
	Individual entrepreneurial orientation	Correlation Coefficient	,931**	,550**	,822**	1,000	,539**
		Sig. (2-tailed)	0,000	,000	0,000	0,000	,000
		N	3595	3574	3583	3601	3599

Social_context	Correlation Coefficient	,511**	,322**	,474**	,539**	1,000
	Sig. (2-tailed)	,000	,000	,000	,000	
	N	3593	3572	3582	3599	3615

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Table 20

Spearman's test for H12-H15, correlations, per countries

Country				Innovativeness and Creativity	Proactiveness (You usually act in anticipation of future problems, needs or changes)	Risk-taking	Individual entrepreneurial orientation	Social context
POL	Spearman's rho	Innovativeness and Creativity	Correlation Coefficient	1,000	,190**	,365**	,887**	,045
			Sig. (2-tailed)		,000	,000	0,000	,151
			N	1024	1022	1022	1024	1024
		Proactiveness (You usually act in anticipation of future problems, needs or changes)	Correlation Coefficient	,190**	1,000	,097**	,359**	-,008
			Sig. (2-tailed)	,000		,002	,000	,810
			N	1022	1022	1020	1022	1022
	Risk-taking	Correlation Coefficient	,365**	,097**	1,000	,691**	,051	
		Sig. (2-tailed)	,000	,002		,000	,100	
		N	1022	1020	1022	1022	1022	
	Individual entrepreneurial orientation	Correlation Coefficient	,887**	,359**	,691**	1,000	,051	
		Sig. (2-tailed)	0,000	,000	,000		,106	
		N	1024	1022	1022	1024	1024	
Social_context	Correlation Coefficient	,045	-,008	,051	,051	1,000		
	Sig. (2-tailed)	,151	,810	,100	,106			
	N	1024	1022	1022	1024	1029		
UA	Spearman's rho	Innovativeness and Creativity	Correlation Coefficient	1,000	,171**	,420**	,890**	,016
			Sig. (2-tailed)		,000	,000	,000	,660
			N	730	724	725	730	730
		Proactiveness (You usually act in anticipation of future problems, needs or changes)	Correlation Coefficient	,171**	1,000	,106**	,361**	,025
			Sig. (2-tailed)	,000		,004	,000	,493
			N	724	727	725	727	727
	Risk-taking	Correlation Coefficient	,420**	,106**	1,000	,719**	-,001	
		Sig. (2-tailed)	,000	,004		,000	,979	
		N	725	725	729	729	729	
	Individual entrepreneurial orientation	Correlation Coefficient	,890**	,361**	,719**	1,000	,030	
		Sig. (2-tailed)	,000	,000	,000		,419	
		N	730	727	729	734	734	
Social_context	Correlation Coefficient	,016	,025	-,001	,030	1,000		
	Sig. (2-tailed)	,660	,493	,979	,419			
	N	730	727	729	734	739		
LV	Spearman's rho	Innovativeness and Creativity	Correlation Coefficient	1,000	,333**	,348**	,878**	,257**
			Sig. (2-tailed)		,000	,000	,000	,000
			N	367	367	361	367	366
		Proactiveness (You usually act in anticipation of future problems, needs or changes)	Correlation Coefficient	,333**	1,000	,210**	,521**	,196**
			Sig. (2-tailed)	,000		,000	,000	,000
			N	367	367	361	367	366
	Risk-taking	Correlation Coefficient	,348**	,210**	1,000	,684**	,211**	
		Sig. (2-tailed)	,000	,000		,000	,000	
		N	361	361	363	363	363	
	Individual entrepreneurial orientation	Correlation Coefficient	,878**	,521**	,684**	1,000	,284**	
		Sig. (2-tailed)	,000	,000	,000		,000	
		N	367	367	363	369	368	

BUG	Spearman's rho	Social_context	Correlation Coefficient	,257**	,196**	,211**	,284**	1,000
			Sig. (2-tailed)	,000	,000	,000	,000	
			N	366	366	363	368	368
		Innovativeness and Creativity	Correlation Coefficient	1,000	,229**	,384**	,915**	,133
			Sig. (2-tailed)		,001	,000	,000	,064
			N	195	195	193	195	194
		Proactiveness (You usually act in anticipation of future problems, needs or changes)	Correlation Coefficient	,229**	1,000	-,024	,341**	-,152*
			Sig. (2-tailed)	,001		,744	,000	,034
			N	195	195	193	195	194
		Risk-taking	Correlation Coefficient	,384**	-,024	1,000	,668**	,241**
			Sig. (2-tailed)	,000	,744		,000	,001
			N	193	193	193	193	192
LT	Spearman's rho	Individual entrepreneurial orientation	Correlation Coefficient	,915**	,341**	,668**	1,000	,170*
			Sig. (2-tailed)	,000	,000	,000		,018
			N	195	195	193	195	194
		Social_context	Correlation Coefficient	,133	-,152*	,241**	,170*	1,000
			Sig. (2-tailed)	,064	,034	,001	,018	
			N	194	194	192	194	200
		Innovativeness and Creativity	Correlation Coefficient	1,000	,608**	,702**	,941**	,754**
			Sig. (2-tailed)		,000	,000	0,000	,000
			N	1279	1263	1276	1279	1279
		Proactiveness (You usually act in anticipation of future problems, needs or changes)	Correlation Coefficient	,608**	1,000	,560**	,730**	,588**
			Sig. (2-tailed)	,000		,000	,000	,000
			N	1263	1263	1262	1263	1263
Risk-taking	Correlation Coefficient	,702**	,560**	1,000	,868**	,667**		
	Sig. (2-tailed)	,000	,000		0,000	,000		
	N	1276	1262	1276	1276	1276		
Individual entrepreneurial orientation	Correlation Coefficient	,941**	,730**	,868**	1,000	,788**		
	Sig. (2-tailed)	0,000	,000	0,000		,000		
	N	1279	1263	1276	1279	1279		
Social_context	Correlation Coefficient	,754**	,588**	,667**	,788**	1,000		
	Sig. (2-tailed)	,000	,000	,000	,000			
	N	1279	1263	1276	1279	1279		

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Table 21

Logistic Analysis, total sample

**Model Summary**

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
→ 1	3041,122 <sup>a</sup>	,412	,550

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than ,001.

Table 22

Students enrolled in tertiary education, 2013-2019, Eurostat

GEO/TIME	2012	2013	2014	2015	2016	2017	2018	2019
European Union - 27 c :	17 231 328	17 212 746	17 215 035	17 158 296	17 340 948	17 502 045	16 863 363	
European Union - 28 c :	19 617 527	19 565 679	19 545 882	19 536 963	19 772 834	19 969 131	19 481 650	
Belgium :	488 488	495 910	504 745	508 270	526 760	515 530	519 212	
Bulgaria :	283 959	283 294	278 953	266 707	249 937	236 335	229 464	
Czechia :	427 441	418 624	395 529	371 948	352 873	329 036	319 343	
Denmark :	291 147	301 399	313 756	314 822	312 379	310 903	308 567	
Germany (until 1990 fo	208 500	2 780 013	2 912 204	2 977 781	3 043 084	3 091 694	3 127 927	3 296 249
Estonia :	64 806	59 998	55 214	51 092	47 390	45 773	45 484	
Ireland :	199 428	203 912	214 632	218 411	225 031	231 201	232 512	
Greece :	659 284	677 429	690 868	709 488	735 027	766 874	794 107	
Spain :	1 969 413	1 982 162	1 963 924	1 968 702	2 010 183	2 051 826	2 083 979	
France :	2 338 135	2 388 880	2 424 158	2 480 186	2 532 831	2 618 729	2 685 408	
Croatia :	164 623	165 161	162 022	162 017	165 197	164 826	163 867	
Italy :	1 872 693	1 849 159	1 826 477	1 815 950	1 837 051	1 895 990	1 937 761	
Cyprus :	31 965	33 674	37 166	40 347	45 263	47 169	50 211	
Latvia :	94 474	89 671	85 881	84 282	82 914	81 602	80 355	
Lithuania :	159 695	148 389	140 629	133 759	125 863	118 287	111 768	
Luxembourg :	6 617	6 788	6 896	6 954	7 058	7 043	7 102	
Hungary :	359 040	329 455	307 729	295 328	287 018	283 350	281 461	
Malta :	12 574	12 610	13 216	13 764	14 425	15 220	16 068	
Netherlands :	674 752	702 183	842 601	843 180	875 455	889 506		
Austria :	422 778	421 225	425 972	431 125	430 370	430 195	423 049	
Poland :	1 902 718	1 762 666	1 665 305	1 600 208	1 550 203	1 492 899	1 430 981	
Portugal :	360 818	362 200	337 507	343 117	346 963	356 390	368 181	
Romania :	618 157	578 706	541 653	535 218	531 586	538 871	533 749	
Slovenia :	97 706	92 769	85 616	80 798	79 547	76 534	75 991	
Slovakia :	209 543	197 854	184 390	167 280	156 048	144 447	140 809	
Finland :	309 009	306 080	302 478	297 163	295 528	294 516	295 451	
Sweden :	436 603	429 444	429 937	426 188	426 354	431 065	432 233	
Iceland :	19 097	19 901	18 940	18 590	17 967	17 835	18 297	
Liechtenstein :	845	830	750	774	799	850	911	
Norway :	255 416	264 207	268 231	277 449	284 042	288 739	290 014	
Switzerland :	279 803	289 722	294 450	295 149	300 618	306 743	312 933	
United Kingdom :	2 386 199	2 349 854	2 330 847	2 378 667	2 431 886	2 467 086	2 618 287	
Montenegro :				24 643	25 014			
North Macedonia :	60 682	60 572	63 543	63 252	61 488	56 685	56 685	
Serbia :	238 945	242 848	241 054	251 162	262 108	256 172	249 771	
Turkey :	4 975 690	5 472 521	6 062 886	6 689 185	7 198 987	7 560 371	7 775 381	
Bosnia and Herzegovia						95 142	89 016	

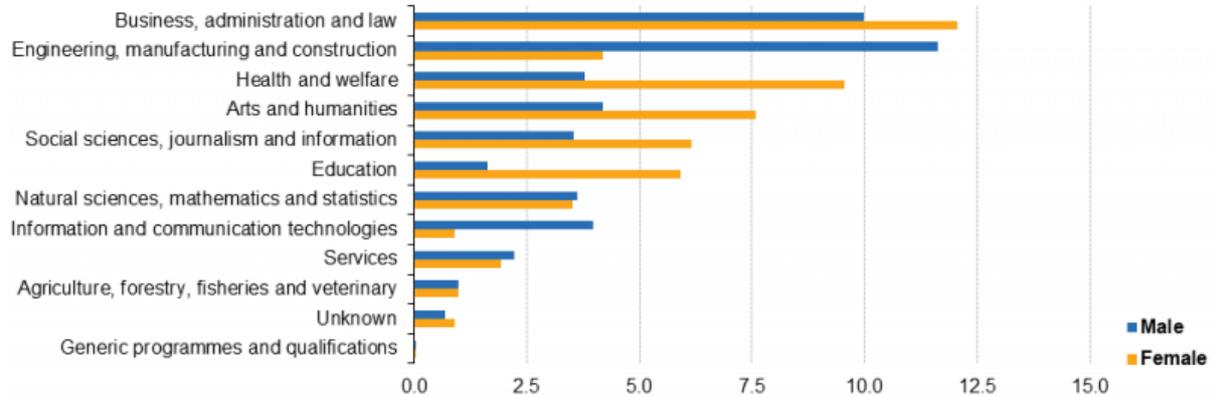
Table 23

Students enrolled in tertiary education in business, administration, and law, 2013-2019,  
Eurostat

GEO/TIME	2012	2013	2014	2015	2016	2017	2018	2019
European Union	3 868 864	4 003 257	3 613 395	3 909 622	3 909 337	3 858 498	3 682 262	
European Union	4 285 727	4 420 240	4 038 827	4 374 183	4 386 167	4 363 021	4 270 804	
Belgium	103 393	106 886	99 061	100 835	108 068	107 668	109 605	
Bulgaria	81 904	81 007	78 460	71 554	63 662	57 703	51 916	
Czechia	99 005	92 952	78 235	70 526	66 618	63 525	61 027	
Denmark	72 315	72 752	72 844	72 462	71 967	72 650	72 670	
Germany (until 2011)	607 506	653 868	674 827	688 937	682 097	690 089	753 269	
Estonia	16 151	14 485	13 056	11 672	10 748	10 573	10 449	
Ireland	37 625	37 917	39 813	41 906	43 439	45 874	49 007	
Greece	118 678	141 390	142 419	146 269	150 215	155 969	164 082	
Spain	428 697	420 662	414 851	410 828	417 687	422 853	425 510	
France	655 112	663 530	696 961	707 315	721 433	723 619	672 554	
Croatia	55 112	44 206	45 141	44 789	44 236	42 775	41 384	
Italy	402 633	388 887	390 033	384 171	336 317	350 313		
Cyprus	12 560	12 439	14 475	16 916	19 352	19 983	20 546	
Latvia	31 578	29 010	27 469	25 195	22 922	22 589	21 771	
Lithuania	53 787	48 484	43 697	39 227	34 610	31 098	29 206	
Luxembourg	2 378	2 377	2 488	2 409	2 434	2 362	2 220	
Hungary	107 755	90 583	76 761	70 010	64 828	65 085	64 074	
Malta	3 011	3 199	3 399	3 743	3 857	4 107	4 430	
Netherlands	184 953	195 124	197 612	197 643	198 121	202 519		
Austria	102 856	102 212	90 920	92 370	92 830	93 834	101 552	
Poland	468 223	422 802	378 034	359 970	351 295	328 963	317 571	
Portugal	73 436	74 779	70 245	72 141	72 845	76 136	80 490	
Romania	155 504	133 393	136 930	128 471	127 233	128 375	128 096	
Slovenia	21 037	18 145	16 153	14 875	14 476	14 106	13 784	
Slovakia	45 731	43 270	35 294	31 533	29 351	26 794	25 752	
Finland	50 107	50 793	50 869	51 533	52 132	52 642	52 418	
Sweden	62 770	61 851	60 124	58 132	58 710	60 290	58 566	
Iceland	4 097	4 247	4 108	4 005	3 669	3 529	3 510	
Liechtenstein	31	49	45	530	535	566	622	
Norway	48 563	50 503	49 168	52 160	53 736	54 475	53 357	
Switzerland	73 804	73 825	74 003	75 481	76 643	77 724	78 524	
United Kingdom	416 863	392 078	450 321	464 561	476 830	504 522	588 542	
Montenegro								
North Macedonia	18 878	17 475	17 556	16 742	16 061	12 632	12 632	
Serbia	59 637	59 208	55 048	50 276	47 651	43 912	40 925	
Turkey	2 214 061	2 410 905	2 593 774	2 814 557	2 953 431	3 053 699	3 087 699	
Bosnia and Herzegovina						17 200	15 331	

## Distribution of tertiary education students by broad field and sex, EU-27, 2018

(%)



Note: ranked on the total (male and female) share of students in each broad field.

Source: Eurostat (online data code: educ\_uae\_enrt03)

eurostat

Fig. 5 Distribution of tertiary education students in accordance with field

Table 24

## Graduates EU 2005-2019, Eurostat

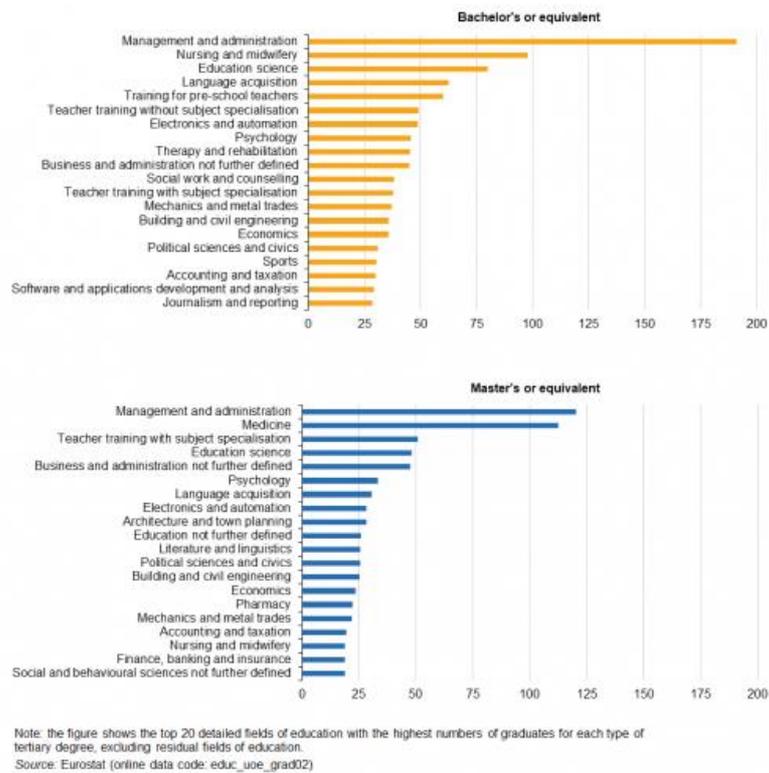
GEO/TIME	2005	2010	2012	2013	2014	2015	2016	2017	2018	2019
European	:	:	:	4 739 995	4 740 049	4 693 196	4 563 126	4 774 729	4 689 784	4 933 728
European	:	:	:	3 948 050	3 967 687	3 952 920	3 799 983	3 990 777	3 872 444	4 066 983
Turkey	:	:	:	:	733 237	801 498	802 822	804 435	845 859	891 458
United Kin	:	:	:	791 945	772 362	740 276	763 144	783 952	817 340	866 745
France	600 871	657 009	:	733 552	742 565	762 734	772 779	780 630	795 961	804 431
Germany (f	:	:	:	495 808	521 845	544 743	556 800	569 154	564 692	649 520
Spain	290 474	346 259	391 956	407 036	443 321	438 616	438 661	445 559	461 138	458 528
Poland	501 393	624 799	:	598 124	557 769	516 675	487 640	517 305	469 992	452 628
Italy	:	:	:	361 907	374 353	370 298	373 775	388 605	399 828	416 631
Netherlands	:	:	:	138 287	141 270	148 942	:	155 504	159 572	161 049
Romania	:	:	:	172 186	153 515	133 478	121 788	121 250	126 271	124 759
Belgium	80 714	103 967	:	107 884	110 888	112 406	119 141	115 870	116 671	114 468
Switzerland	:	:	:	81 909	85 750	86 178	87 479	88 696	89 468	91 536
Ireland	:	:	:	61 297	64 955	70 374	72 952	78 002	84 043	85 485
Austria	:	70 955	:	85 278	81 990	83 587	83 396	84 862	84 259	84 641
Denmark	:	:	:	66 467	70 246	74 428	85 290	82 581	81 575	82 550
Portugal	68 073	75 002	:	78 947	74 129	74 757	73 086	77 034	79 849	81 138
Sweden	58 913	61 435	:	72 782	74 736	78 244	78 112	73 511	75 723	77 310
Czechia	:	:	:	99 932	104 671	98 119	90 725	87 131	76 158	72 714
Greece	:	:	:	66 220	67 310	68 444	69 929	69 134	70 312	70 747
Hungary	76 321	72 374	:	73 628	72 465	68 485	68 110	63 109	65 079	62 715
Finland	39 700	48 490	:	52 730	53 878	56 829	56 066	56 136	57 784	59 040
Norway	33 319	40 394	:	44 753	47 742	48 212	49 010	53 085	54 379	56 259
Bulgaria	46 038	60 523	:	66 423	63 373	62 718	60 383	56 851	54 480	51 464
Serbia	:	:	:	:	50 728	50 501	50 326	51 596	45 406	45 280
Slovakia	36 337	76 899	:	70 031	66 194	61 054	56 280	50 622	44 467	40 324
Croatia	:	:	:	36 857	35 191	36 144	34 028	33 989	34 401	34 882
Lithuania	:	:	:	39 265	33 130	32 205	29 683	27 684	26 280	25 031
Bosnia and	:	:	:	:	:	:	:	:	:	17 735
Slovenia	15 787	19 694	:	19 175	18 824	18 631	30 967	16 458	16 680	16 100
Latvia	26 124	26 545	:	21 610	17 345	17 021	15 796	14 587	15 363	14 848
Cyprus	3 676	5 053	:	6 354	7 763	7 941	8 545	9 304	9 149	10 367
North Mac	:	:	:	11 363	12 263	11 144	10 465	10 731	9 826	9 994
Estonia	:	11 450	:	10 867	10 190	10 491	10 256	9 576	9 067	9 022
Montenegr	:	:	:	:	:	:	5 043	5 041	4 913	5 026
Malta	:	:	:	3 803	3 924	3 953	4 113	4 580	4 205	4 870
Iceland	:	:	:	4 008	4 224	4 407	4 564	4 484	4 389	4 375
Luxembou	:	:	:	1 600	1 847	1 603	1 682	1 748	1 753	1 725
Liechtenst	:	:	:	312	271	283	259	259	163	227

Table 25

## Graduates in Business, Administration, and Law EU 2005-2019, Eurostat

GEO/TIME	2005	2010	2012	2013	2014	2015	2016	2017	2018	2019
European	:	:	:	:	958 455	964 281	934 108	988 041	950 975	1 007 683
European	:	:	:	:	1 112 724	1 126 871	1 103 683	1 161 054	1 132 822	1 216 491
Belgium	16 576	20 008	:	21 096	20 194	22 702	25 182	24 719	23 713	23 586
Bulgaria	14 468	22 752	:	24 074	22 101	21 283	20 590	18 728	17 351	15 878
Czechia	:	:	:	26 457	25 594	20 323	18 266	16 268	15 138	13 719
Denmark	:	:	:	17 638	18 577	15 200	21 205	20 415	20 923	20 966
Germany (C)	:	:	:	110 119	116 791	124 233	130 048	128 407	128 087	159 205
Estonia	:	:	:	2 579	2 355	2 589	2 466	2 223	2 066	2 146
Ireland	:	:	:	13 258	14 834	18 213	17 996	19 373	22 462	22 097
Greece	:	:	:	11 940	13 273	14 205	14 843	14 000	15 366	13 974
Spain	64 528	64 553	77 824	81 674	85 975	84 293	81 601	84 178	89 115	88 298
France	196 058	230 069	:	253 570	250 091	258 148	256 982	269 239	272 659	277 110
Croatia	:	:	:	11 888	11 653	11 350	10 705	10 086	8 671	7 997
Italy	:	:	:	68 033	70 805	:	72 239	74 798	70 571	73 890
Cyprus	:	:	:	2 464	2 812	2 807	3 032	3 337	3 565	3 835
Latvia	:	:	:	6 961	5 774	5 445	4 841	4 452	4 374	4 218
Lithuania	:	:	:	12 600	10 356	10 218	8 957	7 556	6 717	6 115
Luxembou	:	:	:	660	721	620	674	766	745	728
Hungary	26 967	21 756	:	24 274	21 081	17 050	15 942	15 412	16 540	15 891
Malta	:	:	:	1 130	1 024	1 054	1 189	1 452	1 331	1 659
Netherland	:	:	:	:	:	:	:	42 722	43 455	43 981
Austria	:	17 471	:	20 954	19 344	18 070	18 122	19 414	20 513	20 351
Poland	:	:	:	:	147 831	122 209	118 466	125 870	110 291	107 177
Portugal	12 079	13 121	:	14 609	13 618	13 950	13 944	14 915	16 178	16 630
Romania	:	:	:	47 777	41 351	39 625	34 572	33 550	33 751	33 337
Slovenia	:	:	:	4 385	4 285	4 161	7 199	3 348	3 416	2 934
Slovakia	:	:	:	16 324	16 002	13 045	11 444	10 316	8 924	8 406
Finland	7 067	7 512	:	9 262	9 650	10 233	10 242	10 604	10 892	11 091
Sweden	8 444	8 783	:	11 861	12 363	13 999	13 360	11 893	12 422	12 468
Iceland	:	:	:	945	887	1 002	1 025	976	958	893
Liechtenst	:	:	:	1	3	3	198	198	125	173
Norway	4 347	6 234	:	6 323	7 714	7 616	7 898	9 862	9 278	9 119
Switzerland	:	:	:	24 246	25 129	24 416	24 992	25 180	25 323	25 331
United King	:	:	:	162 919	154 269	162 590	169 575	173 013	181 847	208 807
Montenegr	:	:	:	:	:	:	:	:	0	0
North Mace	:	:	:	4 194	4 526	3 384	3 399	3 135	3 122	2 829
Serbia	:	:	:	13 328	13 328	13 193	12 586	12 363	10 473	10 743
Turkey	:	:	:	:	280 781	306 791	277 442	252 561	260 576	266 105
Bosnia and	:	:	:	:	:	:	:	:	:	3 913

**Number of tertiary education graduates in each detailed field of education, EU-27, 2018**  
(thousands)



eurostat

**Fig. 6 Number of tertiary education graduates in each detailed field of education, EU-27, 2018**

Table 26

Pupils enrolled in vocational upper secondary and post-secondary non-tertiary education,  
2008-2019, Eurostat

GEO/TIME	2013	2014	2015	2016	2017	2018	2019
Montenegro	:	:	:	18 897	18 723	:	:
Serbia	214 393	205 436	197 538	:	:	:	:
European Union - 28 countries (2007-2019)	:	:	9 864 935	9 755 362	#####	#####	9 951 987
European Union - 27 countries (from 2007)	:	:	8 146 262	7 990 287	8 482 312	8 537 936	8 509 805
Turkey	2 269 651	2 513 887	2 788 117	2 760 140	2 713 530	2 614 785	2 399 260
Italy	1 067 253	1 573 016	1 580 693	1 573 663	1 566 407	1 530 356	1 515 671
United Kingdom	1 801 776	1 711 604	1 718 673	1 765 075	1 752 287	1 558 556	1 442 181
Germany (until 1990 former territories of the German Democratic Republic)	1 223 673	1 232 771	1 202 449	1 183 083	1 136 356	1 126 502	1 166 146
France	1 109 601	1 108 625	1 081 359	1 080 091	1 078 016	1 072 405	1 065 632
Poland	774 844	733 588	722 902	697 988	684 955	672 025	664 678
Spain	547 099	572 184	594 148	594 479	599 747	611 772	634 993
Netherlands	487 719	478 185	546 269	536 402	570 592	560 509	565 971
Belgium	466 040	463 451	460 591	455 259	439 501	426 537	425 848
Romania	511 259	459 500	437 720	417 329	413 229	409 419	404 682
Czechia	321 686	304 211	292 892	284 557	281 177	277 013	275 567
Austria	259 553	253 506	248 660	241 386	238 161	236 857	240 605
Finland	252 191	251 652	257 764	258 482	261 660	261 248	226 965
Switzerland	230 304	229 890	230 515	228 403	226 342	224 541	220 894
Sweden	242 586	219 512	195 158	185 218	186 467	195 448	190 423
Hungary	132 463	118 129	102 305	90 490	97 724	158 318	180 373
Portugal	182 518	177 169	176 573	161 192	162 613	159 254	155 576
Bulgaria	148 968	154 073	146 191	136 539	132 932	153 023	146 713
Norway	130 789	126 800	124 816	127 056	126 007	125 301	128 713
Slovakia	151 404	143 187	138 303	134 639	130 768	127 302	123 307
Denmark	134 687	131 279	132 370	122 082	114 940	109 573	106 253
Greece	124 944	111 062	102 292	99 290	99 132	98 447	104 652
Croatia	:	131 830	127 787	121 466	114 910	109 303	103 827
Bosnia and Herzegovina	:	:	:	:	:	94 557	90 744
Ireland	2 260	:	:	:	19 280	91 001	64 234
Slovenia	61 245	60 601	59 815	67 073	66 513	65 536	63 865
North Macedonia	54 053	51 813	50 009	48 531	45 294	43 431	43 431
Latvia	27 992	26 464	24 847	23 010	23 591	23 646	23 523
Estonia	15 118	14 250	14 541	16 163	17 708	17 957	17 984
Lithuania	25 139	23 042	21 579	20 540	20 133	18 398	16 583
Luxembourg	14 612	14 892	15 566	15 821	16 067	16 195	16 103
Iceland	8 017	7 923	7 901	7 467	6 768	6 322	6 099
Malta	4 581	4 866	5 072	5 557	4 916	5 181	4 973
Cyprus	4 360	4 652	4 685	4 890	4 818	4 711	4 658
Liechtenstein	1 190	1 195	1 183	1 151	1 120	1 042	1 106

Table 27

Pupils enrolled in vocational upper secondary and post-secondary non-tertiary education in business, administration, and law, 2008-2019, Eurostat

GEO/TIME	2013	2014	2015	2016	2017	2018	2019
Montenegro	:	:	:	4 154	4 933	:	:
Serbia	:	:	:	:	:	:	:
European Union - 28 countries	:	:	1 904 466	1 840 979	1 886 696	1 819 964	1 784 221
European Union - 27 countries	:	:	1 575 249	1 508 538	1 575 416	1 552 129	1 544 773
Germany (until 1990 former GDR)	401 376	412 746	397 886	392 141	370 457	362 480	375 184
Italy	:	360 138	360 048	343 946	332 912	321 386	311 155
France	252 472	247 908	244 111	246 282	246 387	245 052	242 952
United Kingdom	156 576	372 074	329 216	332 441	311 280	267 835	239 448
Turkey	198 117	148 744	233 949	211 256	68 726	74 536	191 351
Spain	80 902	86 726	82 984	81 470	86 121	86 621	90 204
Netherlands	93 112	89 834	87 939	86 750	85 985	84 357	82 083
Poland	:	70 344	77 615	74 002	75 593	78 051	80 366
Switzerland	72 427	71 611	70 822	70 329	69 167	67 990	65 239
Austria	64 986	62 699	61 228	59 007	58 139	57 317	57 104
Belgium	84 493	83 279	89 464	64 979	59 000	58 079	56 289
Czechia	75 060	65 836	59 663	56 169	54 058	50 234	48 867
Finland	38 626	38 275	39 701	40 257	42 415	44 042	39 884
Denmark	36 700	35 902	33 029	28 457	25 135	23 335	22 894
Portugal	26 737	28 720	28 036	23 637	23 038	21 879	21 046
Croatia	:	:	:	4 006	20 609	19 165	20 685
Slovakia	30 000	26 173	22 949	20 877	19 468	18 193	17 411
Bulgaria	18 105	18 204	15 545	13 559	12 534	13 723	12 485
Ireland	:	:	:	:	:	11 778	11 716
Sweden	10 726	9 581	9 173	8 996	9 320	9 734	10 554
Slovenia	11 680	11 244	10 420	12 141	11 320	10 848	10 381
Norway	7 646	7 712	7 736	8 139	8 409	8 759	8 878
Hungary	17 259	14 382	11 684	9 064	14 668	10 630	8 706
Greece	8 573	11 096	13 634	12 212	10 055	8 114	8 498
Bosnia and Herzegovina	:	:	:	:	:	7 388	6 904
North Macedonia	13 034	12 368	0	7 210	6 726	5 956	5 956
Romania	4 509	4 129	4 744	4 775	5 958	5 596	5 545
Luxembourg	5 223	5 127	5 362	5 088	5 245	5 209	5 123
Latvia	3 930	3 763	3 348	2 954	2 848	2 749	2 769
Lithuania	4 561	4 016	3 685	3 450	3 167	2 506	1 890
Malta	215	212	710	838	687	745	681
Estonia	390	306	231	231	297	306	302
Liechtenstein	321	321	307	313	295	289	298
Iceland	288	237	170	113	69	45	27
Cyprus	11	7	0	0	0	0	0

Table 28

Graduates in vocational upper secondary and post-secondary non-tertiary education, 2008-2019, Eurostat

GEO/TIME	2005	2010	2012	2013	2014	2015	2016	2017	2018	2019
Serbia	:	:	:	:	50 213	:	:	:	:	:
European Union - 28 countries	:	:	:	:	:	:	3 120 822	3 124 771	2 908 213	2 955 611
European Union - 27 countries	:	:	:	:	:	2 427 660	2 345 955	2 355 185	2 209 417	2 281 289
United Kingdom	:	:	:	938 455	:	:	774 866	769 585	698 797	674 322
France	513 125	530 248	:	576 637	600 938	581 162	583 288	586 594	577 856	562 198
Turkey	:	:	:	:	426 866	471 885	515 465	505 261	495 658	455 323
Germany (until 1990 former ter	:	:	:	344 497	350 442	340 052	332 882	319 068	314 236	320 041
Italy	:	:	:	:	:	307 253	306 318	322 002	300 592	299 830
Spain	97 495	116 614	213 776	141 869	151 010	152 059	162 330	165 332	166 948	191 368
Poland	280 838	207 468	:	198 040	166 663	177 635	170 209	166 681	158 508	152 115
Netherlands	:	188 556	:	163 781	161 042	155 473	143 883	146 661	140 343	141 501
Romania	:	:	:	138 658	111 886	118 977	91 511	98 997	97 975	98 064
Belgium	70 535	77 224	:	70 938	71 028	77 890	73 389	71 364	69 678	68 316
Switzerland	:	:	:	68 807	67 620	69 622	69 196	68 851	69 103	68 010
Austria	:	78 065	:	78 689	78 243	77 883	75 020	72 399	70 006	67 660
Finland	53 082	61 270	:	63 272	65 795	68 461	67 590	69 395	70 578	63 210
Czechia	:	:	:	75 979	66 720	61 603	56 715	57 725	57 188	58 131
Portugal	:	45 826	:	62 986	63 185	49 829	33 775	34 989	35 543	34 341
Slovakia	61 760	52 261	:	40 291	36 242	33 408	32 357	30 822	30 753	30 250
Norway	23 959	23 155	:	23 567	25 398	25 857	27 073	27 851	27 953	29 376
Croatia	:	:	:	:	32 458	35 273	33 487	31 402	30 164	28 217
Sweden	34 615	46 107	:	44 347	34 076	31 279	29 164	28 220	27 427	28 067
Denmark	:	:	:	34 281	33 362	32 042	33 645	30 931	29 072	26 014
Bosnia and Herzegovina	:	:	:	:	:	:	:	:	:	25 078
Greece	:	:	:	37 688	36 833	30 088	25 274	28 626	26 742	23 132
Ireland	:	:	:	:	25 623	22 370	24 141	25 012	22 842	20 977
Hungary	24 486	21 981	:	26 642	26 887	23 513	22 319	20 718	21 467	20 854
Montenegro	:	:	:	:	:	:	5 693	4 884	:	17 725
Bulgaria	32 267	24 200	:	22 101	19 764	18 467	16 014	16 138	15 882	15 813
Slovenia	21 041	15 686	:	13 981	13 135	13 167	13 909	14 003	13 925	13 823
North Macedonia	:	:	:	16 294	14 899	14 776	13 735	13 406	12 577	12 701
Lithuania	:	:	:	6 892	5 864	5 095	5 024	4 692	4 520	4 431
Latvia	2 130	7 682	:	6 308	6 592	4 761	4 391	3 916	3 717	3 734
Luxembourg	:	:	:	2 819	2 842	2 966	3 325	3 511	3 616	3 369
Estonia	:	3 858	:	3 558	3 360	3 541	2 500	2 627	2 751	2 416
Malta	:	:	:	2 219	2 122	2 176	2 132	2 160	2 370	2 176
Iceland	:	:	:	2 311	2 090	1 960	2 082	1 703	1 694	1 637
Cyprus	1 215	1 239	:	1 083	1 192	1 237	1 373	1 238	1 275	1 349
Liechtenstein	:	:	:	348	334	347	360	619	367	335

Table 29

Graduates in vocational upper secondary and post-secondary non-tertiary education in business, administration, and law, 2008-2019, Eurostat

GEO/TIME	2005	2010	2012	2013	2014	2015	2016	2017	2018	2019
Serbia	:	:	:	:	:	:	:	:	:	:
European Union - 28 countries (2008-2019)	:	:	:	:	:	:	557 999	555 215	523 275	516 142
European Union - 27 countries (from 2007)	:	:	:	:	487 867	475 342	471 604	463 110	442 873	445 006
France	132 549	119 803	:	126 055	124 875	118 692	122 907	121 668	122 608	121 451
Germany (until 1990 former territory of ex-GDR)	:	:	:	114 609	119 170	113 677	111 857	106 646	103 568	102 579
United Kingdom	:	:	:	165 492	:	:	86 395	92 105	80 403	71 135
Italy	:	:	:	:	76 712	74 169	71 241	67 849	68 296	66 359
Turkey	:	:	:	:	38 457	51 231	60 475	50 869	48 660	46 866
Netherlands	:	34 467	:	33 029	33 601	31 296	29 108	28 708	27 255	25 821
Spain	23 984	20 299	36 580	16 971	17 753	18 184	20 570	21 756	21 990	22 598
Switzerland	:	:	:	23 163	22 090	23 164	23 091	23 142	22 696	21 925
Austria	:	22 247	:	22 428	22 283	22 496	21 156	20 038	19 570	18 342
Poland	:	18 924	:	18 603	11 273	20 135	20 237	20 338	20 155	17 142
Finland	8 675	9 125	:	9 938	10 249	11 150	11 285	12 423	14 021	12 520
Belgium	12 742	11 246	:	11 920	11 814	12 614	12 372	13 426	12 870	11 342
Czechia	:	:	:	18 982	14 512	11 988	10 713	9 946	9 375	9 487
Denmark	:	:	:	8 275	8 451	7 306	7 164	6 900	6 773	6 507
Portugal	:	0	:	10 678	12 041	7 273	5 430	5 394	4 830	5 028
Croatia	:	:	:	:	:	1 417	1 379	5 814	5 107	4 914
Montenegro	:	:	:	:	:	:	1 411	1 291	:	4 461
Slovakia	14 311	12 405	:	8 858	7 359	6 045	5 276	4 894	4 606	4 266
Ireland	:	:	:	:	0	:	3 553	0	3 447	3 291
Sweden	2 899	4 351	:	3 607	2 109	2 324	2 185	2 264	2 183	2 424
Norway	1 767	1 322	:	1 377	1 475	1 608	1 737	1 926	1 959	2 023
Bosnia and Herzegovina	:	:	:	:	:	:	:	:	:	1 941
Hungary	3 084	3 296	:	3 072	3 297	2 831	2 436	2 949	2 295	1 877
Greece	:	:	:	2 789	2 803	4 976	5 068	4 070	2 258	1 829
Slovenia	7 895	4 018	:	2 650	2 197	2 084	2 119	1 866	1 793	1 786
Bulgaria	4 683	3 130	:	3 326	3 121	2 569	2 035	1 953	2 106	1 736
North Macedonia	:	:	:	3 676	3 372	2 117	2 941	2 970	1 761	1 687
Romania	:	:	:	1 638	1 145	1 114	691	1 363	1 337	1 348
Luxembourg	:	:	:	1 037	1 019	1 062	988	1 152	1 088	988
Lithuania	:	:	:	1 320	1 043	857	807	813	679	607
Latvia	354	1 375	:	701	816	739	676	603	453	465
Malta	:	:	:	151	123	257	318	245	282	245
Liechtenstein	:	:	:	107	106	106	105	303	112	111
Estonia	:	160	:	79	94	88	33	32	55	58
Iceland	:	:	:	323	335	227	263	2	15	11
Cyprus	22	1	:	4	7	0	0	0	0	0

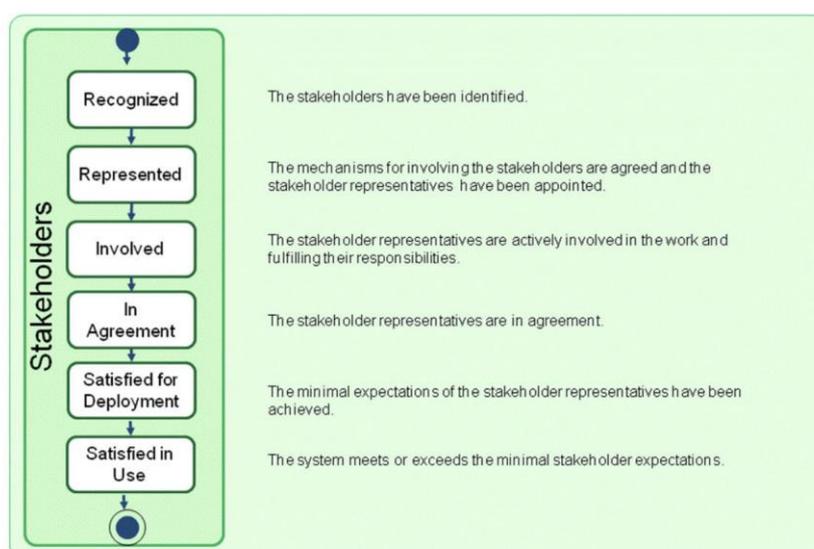


Fig. 7 Stakeholders states succession

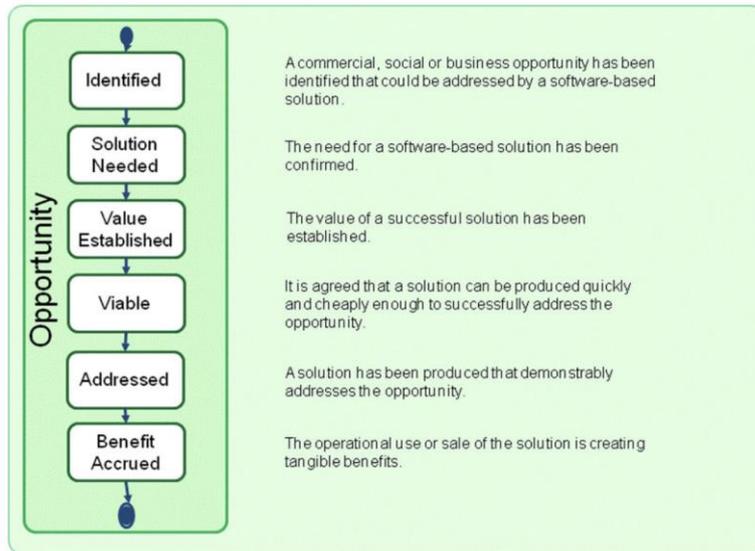


Fig. 8 Opportunity states succession

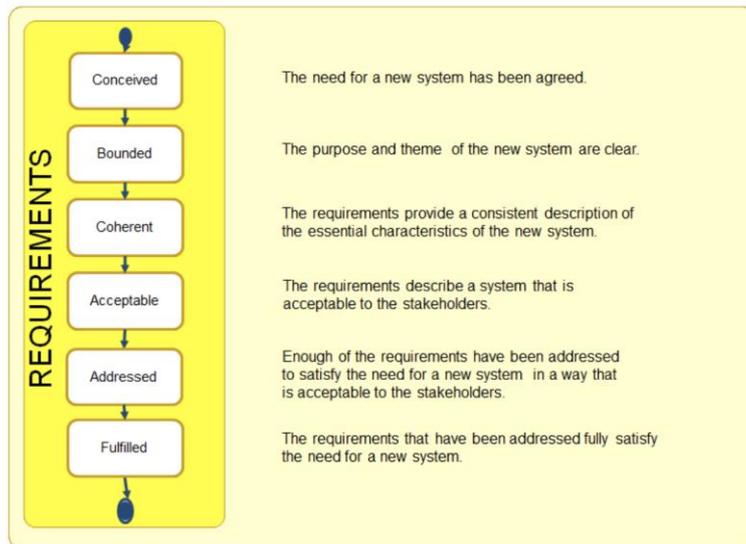


Fig. 9 Requirements states succession

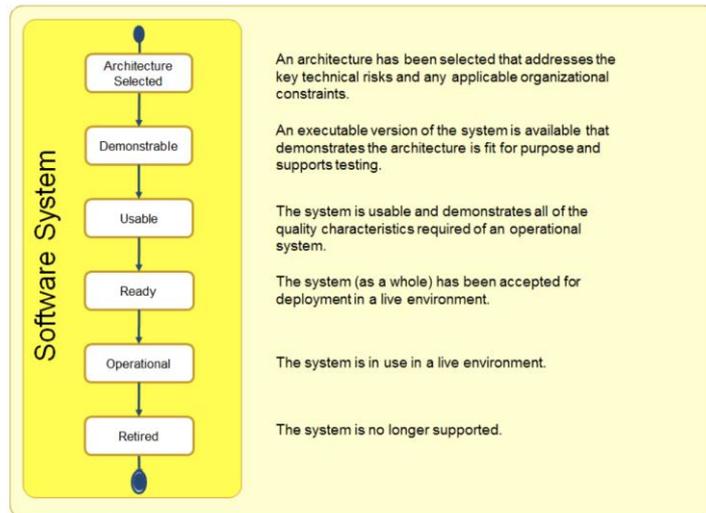


Fig. 10 System states succession

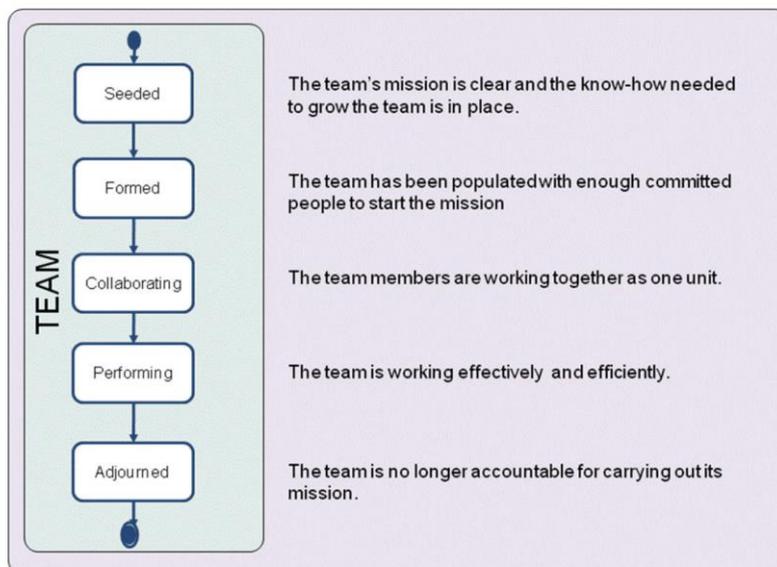


Fig. 11 Team states succession

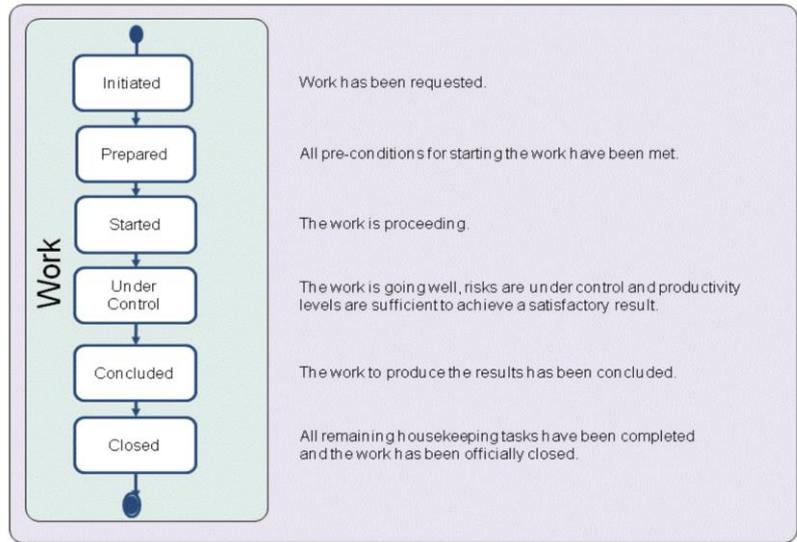


Fig. 12 Work states succession

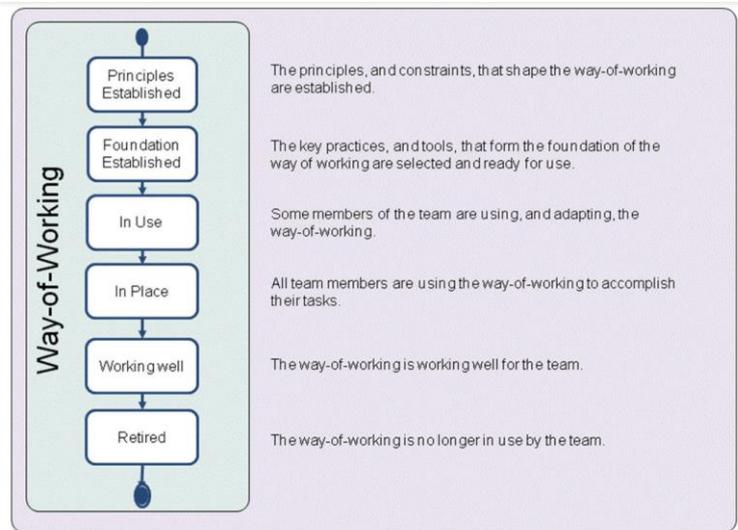


Fig. 13 Way-of-working states succession

Table 30

Checklist for Opportunity Element

Element 2	State Graphs	Checklist	Y/N
Opportunity: Changes in External Environment	Identified	An idea for a way of meeting students' expectations with the educational process' output have been identified	
		There is a demand for the educational service and students are ready to pay for it	
		The other stakeholders who benefit from the opportunity are identified (entrepreneurs)	
	Solution is needed	Due to the changes in external environment students need to acquire (entrepreneurial) competences in BS	
		Market demand for new competences is established	

		Need for new competences developed in BS is clear	
Values established		The value of addressing the changes in the external environment is quantified in absolute terms (e.g., students' tuition fee forecast)	
		The impact of the competences trained in the HEI on the stakeholders is understood	
		The value that the BS offer to stakeholders that fund BS and use the output of educational service is understood	
Viable		A solution how to train and develop the competences in BS is outlined	
		The ballpark estimation of the solution is less than anticipated value	
		The reasons for the changes made in BS are understood by all faculty members	
Addressed		HEI demonstrates changes in programs addressing the changes in external environment	
		Stakeholders agree that the changes are worth for making them available for students	
Benefit Accrued		The trained competences have started to accrue benefit for stakeholders	
		ROI profile is at least as good as was expected	

Table 31

Checklist for System Element

Element 3	State Graphs	Checklist	Y/N
System: Business School or HEI	Structure selected	Educational programs provided by the HEI (BBA, MBA, Executive MBA and other specializations programs) is chosen	
		Programs are described and its boundary is known.	
		How many courses, mandatory, and selective	
		Methodologies (case study) is selected.	
		Key risks on teaching staff agreed to.	
	Demonstrable	digital tools are demonstrated,	
		premises are demonstrated*,	
		administration staff is in place,	
		student support staff is in place*,	
	Useable	governance mechanisms are in place	
		program format is clear,	
	Ready	courses description and expected outcome are available,	
		performance criteria is clear,	
		information and documentation for students is available,	
		BS is accepted by authorities for operations in live environment (accreditation),	
	Operational	students can register to the courses,	
		students are recruited	
		educational content is provided for students,	
	Retired	Meetings with employers are conducted regularly*,	
		agreed service level is supported,	
	program calendar is in place		
	accreditation from state authority is not valid anymore,		

		course content is not updated,	
		students are not recruited.	

\* - the items were added in the methodology upon the interviews with experts

Table 32

Checklist for Requirements Element

Element 4	State Graphs	Checklist	Y/N
Requirements: Competences	Conceived	Initial set of students, entrepreneurs, and authorities agrees that changes in HEI's program are to be produced	
		the stakeholders that will use the changes in program are identified	
		The stakeholders that will fund the initial work on the new system are identified.	
		There is a clear opportunity for the changes in BS program to address	
	Bounded	The students, industry and authorities' representatives involved in developing the changes in BS are identified.	
		Success criteria are clear	
		The stakeholders have a shared understanding of the extent the proposed competences and their training in BS	
		Constraints and assumptions are clear	
	Coherent	The rationale behind the competences required is clear	
		The impact of implementing the requirements (competences) is clear	
		The academic staff understands what must be delivered and agrees to deliver it	
		The most important blocks of the competence's development incorporation into BS blocks usage can be explained.	
	Acceptable	The students, entrepreneurs and authorities accept that the competences describe an acceptable competences training in BS.	
		The value provided by implementing the requirements (competences training) is clear.	
		It is possible to verify that the competences are trained and developed	
	Addressed	The students, entrepreneurs, and authorities, accept the (entrepreneurial) competences as reflecting what the BS does and does not do.	
		The BS changes implementing the competences are accepted by the stakeholders as worth making operational.	
	Fulfilled	The students, entrepreneurs, and authorities accept the competences as capturing what they require to fully satisfy the need for a new BS.	
There are no outstanding competences preventing the BS from being accepted as fully satisfying the requirements.			

Checklist for Team Element

Element 5	State Graphs	Checklist	Y/N
Team: Academic staff	Seeded	The structure of the academic staff is defined.	
		The academic staff's responsibilities are outlined.	
		Required competencies are identified.	
		The academic staff size is determined.	
		Governance rules are defined.	
	Formed	Individual responsibilities are understood.	
		Enough academic staff members have been recruited to enable the study process	
		The academic staff members have met (perhaps virtually) and are beginning to get to know each other	
		Team communication mechanisms have been defined.	
	Collaborating	The academic staff is working as one cohesive unit.	
		Communication within the academic staff members is open and honest.	
		The academic staff members are focused on achieving the team mission.	
		The academic staff members know each other.	
	Performing	The academic staff members consistently meet its commitments.	
		The team continuously adapts to the changing context	
		The team identifies and addresses problems without outside help.	
		Annual performance review meetings with employee take place*	
	Adjourned	The academic staff responsibilities have been handed over or fulfilled.	
The team members are available for assignment to other teams.			
No further effort is being put in by the team to complete the mission			

\* - the item is added in the methodology upon the interviews with experts

Checklist for Work Element

Element 6	State Graphs	Checklist	Y/N
Work: Study process	Initiated	The result required of the study process being initiated is clear.	
		The stakeholders that will fund the process are known	
		The stakeholders that will accept the results are known.	
		The source of funding is clear.	
	Prepared	Cost and effort of the study process are estimated.	
		Teaching faculty members availability is understood.	
		Acceptance criteria are defined and agreed with client.	

		The study process is broken down sufficiently for productive work to start.	
		The academic staff members (or at least one) are ready to start the work.	
	Started	Study process has been started.	
		Work progress is monitored.	
		The study process is being broken down into actionable work items with clear definitions of done.	
		Academic staff members are accepting and progressing tasks	
	Under control	Tasks are being completed.	
		Unplanned work is under control.	
		Measures are available to show progress and velocity.	
		Course milestones are consistently completed on time and within their estimates.	
	Concluded	All outstanding tasks are administrative housekeeping or related to preparing the next piece of work.	
		Work results have been achieved.	
		The students, entrepreneurs, and authorities have accepted the resulting changes in BS program.	
	Closed	Lessons learned have been itemized, recorded, and discussed.	
		Metrics have been made available.	
		The budget has been reconciled and closed.	
The academic staff has been released.			
		There are no outstanding, uncompleted tasks.	

Table 35

Checklist for Way-of-working Element

Element 7	State Graphs	Checklist	Y/N
Way of working: Methodology	Principles established	Principles and constraints are agreed to by the stakeholders and the academic staff.	
		The tool needs of the work and its stakeholders are agreed.	
		The context within which the team will operate is understood.	
		The constraints that apply to the selection, acquisition and use of practices and tools are known	
	Foundation established	The key practices and tools that form the foundation of the methodology are selected.	
		Enough practices for work to start are agreed to by the academic staff.	
		All non-negotiable practices and tools have been identified.	
		The selected practices and tools have been integrated to form a usable methodology	
	In use	The practices and tools are being used during the study process	
		The use of the practices and tools selected are regularly inspected.	
		The practices and tools are being adapted to the academic staff's context	

		Procedures are in place to handle feedback on the academic staff's way of working.	
	In place	The practices and tools are being used by the whole team to perform their work.	
		All academic staff has access to the practices and tools required to do their work.	
		The whole academic staff is involved in the inspection and adaptation of the working methodology	
	Working well	The team naturally applies the practices without thinking about them	
		The tools naturally support the way that the academic staff works.	
		The academic staff continually tunes their use of the practices and tool	
	Retired	The academic staff's methodology is no longer being used.	
		Lessons learned are shared for future use	

Table 36

Validation of Methodology for Assessing whether the output of business educational institution meets stakeholders' requirements (created by author)

	<b>Competence</b>	<b>(1) Not Important</b>	<b>(2) Slightly important</b>	<b>(3) Moderately important</b>	<b>(4) Important</b>	<b>(5) Very important</b>
1.	Innovativeness and Creativity					
2.	Coping with uncertainty					
3.	Working with others					
4.	Self-management and self-awareness					
5.	Mobilizing resources					
6.	Motivation and perseverance					
7.	Taking the initiative					
8.	Planning and management					
9.	Spotting opportunities					
10.	Valuing ideas					
11.	Vision					
12.	Learning Through Experience					
13.	Leadership					
14.	Problem solving					
15.	Openness to risk taking					
16.	Marketing					
17.	Technical knowledge and skills					
18.	Technology entrepreneurship					

19.	Intellectual property protection					
20.	Funding for start-up					
21.	Ability to analyze and evaluate					
22.	Ethical and sustainable thinking					
23.	Financial and economic literacy					

Table 37

Approbation of the methodology. Summary of experts' interviews, 2022

Period	HEI, Expert Name	Outcomes
2022-04-12	Expert 1: Oksana Lenjushenkova, Assoc. prof., Dr. oec, University of Applied Science, (Riga, Latvia)	The proposed methodology might be considered one of the possible methods to conduct an audit for the quality assurance of the educational service provided by a business educational institution. The outputs of the audit provide a holistic view of the system and might be used for quality management. Ideas that are the basis of the methodology go in line with the LR authorities' requirements and recommendations.
		Strengths of the proposed methodology: <p style="margin-left: 40px;">Different stakeholders' involvement in the quality evaluation process</p> <p style="margin-left: 40px;">Focus on continuous improvement and development</p> <p style="margin-left: 40px;">A guide for self-assessment</p>
		Areas that have to be considered for review: <p style="margin-left: 40px;">Employers' perspectives have to be included in the assessment as well as one of the major stakeholders. The enterprises offering the opportunities for students' practices or professional organizations might be involved in the assessment process conducted by HEI.</p> <p style="margin-left: 40px;">Parents, as an important referent group, are missing.</p> <p style="margin-left: 40px;">Roles and responsibilities necessary for successful implementation of the method might be described.</p>
		<b>IEO Index: 3,09 (n = 14)</b>

		Note: IEO Index results are indicative as the sample size is smaller than 50 respondents.
2022-04-13	Expert 2: Claudio Rivera, MBA, PhD, RTU Riga Business School (Riga, Latvia)	<p>The proposed approach includes many elements that are integral parts of an assessment process for an educational program's accreditation. The proposed methodology might be considered a lean thinking-based method to advance HEI resources toward increasing value creation for educational institution beneficiaries. The methodology is evaluated as valuable for experimentation on a smaller scale. Ideas that are the basis of the methodology are not in contradiction with LR authorities' requirements and recommendations.</p> <p>Strengths of the proposed methodology:</p> <p style="padding-left: 40px;">The methodology proposes a way for optimizing the existing HEI resources toward maximizing value creation for its beneficiaries.</p> <p style="padding-left: 40px;">The developed guide for self-assessment is a ready-to-use tool for experimentation.</p> <p style="padding-left: 40px;">Could be a contribution to the full quality assurance process lasting six years for meeting LR HEI accreditation standards.</p> <p>Areas that have to be considered for review:</p> <p style="padding-left: 40px;">A simplified model for the process description might be more readable in the form of a diagram, not a table.</p> <p style="padding-left: 40px;">Fine-tuning the wording of the proposed Essence framework-based adaption might be recommended, e.g., the 'customer' term is suggested to change to 'beneficiary'.</p> <p style="padding-left: 40px;">The diagram represented the Essence framework-based adapted model has to be more clean and clear.</p> <p><b>IEO Index: 3,51 (n = 47)</b></p> <p>Note: IEO Index results are indicative as the sample size is smaller than 50 respondents.</p>
2022-05-04	Expert 3: Magdalena Popowska, Ph.D. in Economics, Professor at the Department of Entrepreneurship,	<p>The proposed methodology is considered a feasible approach for quality assurance of the educational service provided by a business educational institution. The described self-evaluation process is valuable for quality improvement in the institution and benefits the whole organization. The self-appraisal tool and codified stakeholders' expectations might be used as a solid proof of meeting students' expectations. These supporting facts</p>

	<p>Gdansk University of Technology (Gdansk, Poland)</p>	<p>might be demonstrated in the context of the HEI accreditation process.</p> <p>Strengths of the proposed methodology:  The approach addresses the gap in HEI assessments as it requests students to evaluate their competence, not the specific courses.  The methodology implementation is considered feasible and is recommended for commercialization.  The recommended self-retrospection is a valuable observation of changes in the stakeholders' expectations and changes over generations.  The output of the methodology gives added value to business schools in terms of continuous improvement and further development.</p> <p>Areas that have to be considered for review:  It is recommended to think about the right moment at which a single cycle of the self-evaluation process must be started and ended.  The expert suggests defining the optimal number of representatives of the stakeholders to avoid potential conflict of interests when too small or too big groups are inquired to identify their priorities and expectations for the competences for future employability.  Some of the competences have close meaning so that they might be combined (e.g., 'motivation and perseverance and 'taking the initiative').  'Legal literacy' is absent in the list of competences; it might be added separately or combined with some other general competences, e.g., 'financial and economic literacy'.  Wording for some competences might be rephrased (e.g., 'technology entrepreneurship' to 'set-up a technological start-up').</p> <p><b>IEO Index: 3,43 (n = 15)</b>  Note: IEO Index results are indicative as the sample size is smaller than 50 respondents.</p>
<p>2022-05-10</p>	<p>Expert 4:  Līga Peiseniece,  Rector, Associate Professor,  Dr.sc.admin,  Banku</p>	<p>In general, the proposed methodology might be considered as an advanced and very practical method for HEI continuous improvement. Self-reflection is a cornerstone of the method while its output provides a holistic view of the system and might be used as an integral part of an accreditation process as well as quality management auditing. Ideas that are the basis of the methodology are partially overlapped with some</p>

	<p>Augstskola (Riga, Latvia)</p>	<p>existing processes that are already established in the organization, which contributes to the feasibility of the method and increases interest in its application.</p>
		<p>Strengths of the proposed methodology:  A well-structured systemic approach to the HEI evaluation process.  Statuses of the Elements (elements of the HEI system) are described in very detail.  Different stakeholders' involvement in the quality evaluation process.  Focus on continuous improvement and development.  A comprehensive guide for HEI self-assessment.</p>
		<p>Areas that have to be considered for review:  Employers' perspectives have to be included in the assessment as well as one of the major stakeholders. The enterprises offering the opportunities for students' practices or professional organizations might be involved in the assessment process conducted by HEI.  Alumni evaluation could be biased as their perspective can be distorted by their own educational experience in the institution.  Elements (elements of the HEI system) checklists might be updated with numeric values to get as an output of a checklist not only Alpha's status but also its presentation as a numeral value.  Element 3 ('Business School' element of HEI system) is recommended to be explored and assessed as an eco-system, incl. premises, building, meetings with employers, etc.  Element 5 ('Academic staff' element of the HEI system) – is recommended to include in the checklist a control for annual performance appraisal reviews with employees.  Element 6 ('Study process' element of HEI system) – is recommended to include students' support control in the checklist.</p>
		<p><b>IEO Index: n/a</b></p>
<p>2022-05-30</p>	<p>Expert 5: Angelina Rosha, Docent at the Faculty of Engineering Economics and Management</p>	<p>The proposed methodology might be appraised as a well-thought and extensive method for HEI continuous improvement. The proposed method might be assumed to be a cornerstone to starting an HEI transformation process to challenge the status quo and evolve the organization.</p> <p>Strengths of the proposed methodology:  The continuous improvement approach goes through a cycle.</p>

	Riga Technical University (Riga, Latvia)	<p>The proposed method is reasonable and is justified as a cross-industry benchmark.</p> <p>The validity of the HEI evaluation and the findings are supported by the triangulation method applied for stakeholders' interests' management.</p> <hr/> <p>Areas that have to be considered for review:</p> <p>As the proposed method might be evaluated as labor-intensive, it is recommended to consider the adjustable frequency of its application.</p> <p>The start of the HEI assessment process might be synchronized with the accreditation of the educational programs in the educational institution to evaluate whether the demanded requirements and applicable standards are met.</p> <p>It is recommended to split the detailed and comprehensive evaluation process into a light (annual, IEO Index only) and complete (every three years) version of the assessment.</p> <p>HEI self-assessment process might be extended to validate their requirements with regulations provided by the Latvian Ministry of Higher Education and Cabinet of Ministers.</p> <p>It is suggested to re-group the recommended list of competences.</p> <hr/> <p><b>IEO Index: 3,75 (n = 45)</b></p> <p>Note: IEO Index results are indicative as the sample size is smaller than 50 respondents.</p>
2022-06-02	Expert 6: Paulina Kubera, Professor, Vice Head of Institute of Management and Information Systems, Poznan Technological University (Poznan, Poland)	<p>The proposed methodology is fascinating as its key performance indicator requests students to evaluate their level of entrepreneurial orientation, not the specific courses – the point of view addresses the gap that persists in regular practices of HEI assessments. The research is fundamental as it evaluates the student's way of thinking and how it changed over the years of studies because of education.</p> <p>The main drawback of the method lies in its nature – the output of a self-assessment tool's application tends to be distorted by the biases of the assessors.</p> <hr/> <p>Strengths of the proposed methodology:</p> <p>The approach addresses the gap in HEI assessments as it requests students to evaluate their competence, not the specific courses.</p> <p>The output of the methodology gives added value to business schools in terms of continuous improvement and further development.</p>

		<p>Areas that have to be considered for review:</p> <p>It is recommended to compare the findings collected as output of Steps 3, 4, and 5 with the requirement of the regulatory body.</p> <p>1<sup>st</sup> years students tend to be overoptimistic about their abilities. Hence the IEO Index results might be unmotivated at the beginning of studies.</p>
		<p><b>IEO Index: 3,75 (n = 26)</b></p> <p>Note: IEO Index results are indicative as the sample size is smaller than 50 respondents.</p>

Table 38

Updated version of the list for competences prioritization, results of approbation

	<b>Competence</b>	<b>(1) Not Important</b>	<b>(2) Slightly important</b>	<b>(3) Moderately important</b>	<b>(4) Important</b>	<b>(5) Very important</b>
	<b>Based and developed on personality traits</b>					
1.	Leadership and vision					
2.	Openness to risk taking					
3.	Motivation and perseverance					
4.	Self-management and self-awareness					
5.	Innovativeness and Creativity					
6.	Taking the initiative					
7.	Ability to analyze and evaluate					
	<b>Related to a person's education</b>					
	Planning and management					
	Marketing					
	Digital skills and technology entrepreneurship					
	Funding for start-up					
	Legal literacy and intellectual property					
	Financial and economic literacy					
	Ethical and sustainable thinking					
	<b>Acquired because of experience</b>					

	<b>Competence</b>	<b>(1) Not Important</b>	<b>(2) Slightly important</b>	<b>(3) Moderately important</b>	<b>(4) Important</b>	<b>(5) Very important</b>
<b>1.</b>	Working with others					
<b>2.</b>	Mobilizing resources					
<b>3.</b>	Coping with uncertainty					
<b>4.</b>	Learning Through Experience					
<b>5.</b>	Spotting opportunities					
<b>6.</b>	Problem solving					
<b>7.</b>	Valuing ideas					